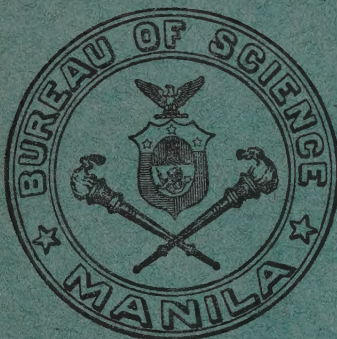


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A REVIEW OF PHILIPPINE CARANGIDÆ ¹

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TWELVE PLATES

The present paper deals with the systematic account of Philippine Carangidæ, based on the numerous specimens in the ichthyological collection of the Division of Fisheries, Department of Agriculture and Commerce, Manila, collected by various persons since 1907. Part of the collection has been worked out by Seale, (138-140) and Herre, (71, 72) Cuvier and Valenciennes, (36) Günther, (67) Bleeker, (23) Kner, (104) Meyer, (115) Jordan and Seale, (137, 138) Smith and Seale, (142) Evermann and Seale, (45) Seale and Bean, (141) Jordan and Richardson, (97) Jordan and Snyder, (96) Fowler, (50, 52) Fowler and Bean, (58) McCulloch, (112) Borodin, (28) Weber and de Beaufort, (152) Herre, (74-77) and Normann, (117) mentioned or described a considerable number of species of this family.

The family includes the cavallas or pampanos, known as *talakitok* and *taratokan* in the Ilocos provinces; as *atoloy* in the

¹ This article is based on work done while the senior author was connected with the Division of Fisheries, Department of Agriculture and Commerce, Manila.

Bicol provinces; as *talakitok*, *muslo*, *pipikat*, *maliputo*, and *simbad* in the Tagalog provinces; and as *ampahan*, *bagudlon*, *baulo*, *lambiao*, *lison*, *mamsa*, *pac-an*, *pagapa*, and *momsa* in the Visayan provinces. They are highly carnivorous fishes that abound in coral reefs; some travel in large schools, often at some distance from the shore. While they are mostly caught by *baclad*, some may be obtained by hook and line. They may be captured also by trolling along the edge of reefs.

Carangoid fishes are mostly marine fishes of large or medium size, usually equipped for rapid swimming, pelagic or coastal. A few species ascend rivers and fresh-water lakes. Due to the practice in some parts of the Philippines of damming rivers completely with fish corrals and preventing the up-and-down movement of fishes, some migratory members of this family are now either very scarce or on the verge of extinction. This depletion is most striking in the case of *Caranx* (*Caranx*) *sexfasciatus*, known as *muslo* in Taal Lake and Pansipit River, Batangas Province, and as *simbad* in Naujan Lake and Lumangbayan River, Mindoro. About ten years ago this fish was available in large numbers in Batangas and Mindoro Provinces; now it is scarce or nonavailable.

CARANGIDÆ

Body more or less compressed, oblong or elongate, or short and deep, with well-developed cycloid scales, or scales reduced and embedded in skin, or scales entirely absent. Caudal peduncle slender. Lateral line complete, arched anteriorly, armed with scutes in its entire length or restricted to straight posterior portion. Scutes may be totally absent. Head more or less compressed. Mouth moderate, more or less oblique, usually protractile. Dentition varied, complete or incomplete, sometimes wanting. Eyelids often well developed. Nostrils paired. Gill openings wide; gill membranes usually not united, free from isthmus. Branchiostegals 7. Gills 4, a slit behind last. Two dorsals; first dorsal short, spinous, with slender or short spines, usually connected by a membrane, depressible in a groove, generally preceded by a subcutaneous spine; second dorsal long, soft. Anal about equal to soft dorsal, preceded by 2 preanal spines that may be united in young. Detached finlets at the posterior portion of soft dorsal and anal sometimes present. Pectorals usually falcate, long or short. Ventrals thoracic,

with one spine and five rays. Caudal forked. Air bladder present. Pyloric cæca usually numerous.

Members of this family are known to inhabit all warm seas of the temperate as well as tropical regions. In the Philippines the family is represented by 4 subfamilies, 15 genera and subgenera, and 36 species as follows:

Family Carangidæ

Subfamily Caranginæ

Genus *Megalaspis*

Megalaspis cordyla

Genus *Decapterus*

Decapterus macrosoma

Genus *Caranx*

Subgenus *Selar*

Caranx (Selar) mate

Caranx (Selar) boops

Caranx (Selar) crumenophthalmus

Caranx (Selar) malam

Caranx (Selar) djedaba

Caranx (Selar) kalla

Subgenus *Carangoides*

Caranx (Carangoides) compressus

Caranx (Carangoides) auroguttatus

Caranx (Carangoides) præustus

Caranx (Carangoides) fulvoguttatus

Caranx (Carangoides) gymnostethoides

Caranx (Carangoides) armatus

Caranx (Carangoides) oblongus

Caranx (Carangoides) chrysophrys

Caranx (Carangoides) malabaricus

Caranx (Carangoides) dinema

Subgenus *Caranx*

Caranx (Caranx) sexfasciatus

Caranx (Caranx) stellatus

Caranx (Caranx) ignobilis

Caranx (Caranx) carangus

Subgenus *Selaroides*

Caranx (Selaroides) leptolepis

Subgenus *Gnathanodon*

Caranx (Gnathanodon) speciosus

Genus *Ulua*

Ulua mandibularis

Genus *Alectis*

Alectis ciliaris

Alectis indica

Genus *Hynnys*

Hynnys momsa

Family Carangidæ—Continued

Subfamily Scomberoidinæ

Genus *Scomberoides**Scomberoides lysan**Scomberoides tolooo-parah**Scomberoides tala**Scomberoides tol*

Subfamily Trachinotinae

Genus *Trachinotus**Trachinotus blochi**Trachinotus bailloni*

Subfamily Seriolinae

Genus *Elagatis**Elagatis bipinnulatus*Genus *Seriola**Seriola nigrofasciata*

Key to the Philippine subfamilies of Carangidæ.

- a*¹. Lateral line more or less arched anteriorly, straight portion partly or wholly armed with scutes. Maxillary with a supplemental bone. Pectorals long, falcate. Anal about as long as soft dorsal.

CARANGINÆ.

- a*². Lateral line without scutes.

- b*¹. Maxillary without distinct supplemental bone. Pectorals short, not falcate. Dorsal and anal of equal length.

- c*¹. With several finlets behind soft dorsal and anal; scales ovate, lanceolate or needlelike..... SCOMBEROIDINÆ.

- c*². Without finlets, scales small, rounded..... TRACHINOTINÆ.

- b*². Maxillary with a distinct supplemental bone. Anal much shorter than soft dorsal, its base not longer than abdomen. Pectorals short, not falcate. With or without a single finlet..... SERIOLINÆ.

CARANGINÆ

Body oblong, ovate or rhombic in shape, generally strongly compressed, covered with small cycloid scales. Cheeks, top of head, and opercular apparatus scaled; scales sometimes wanting on breast. In one genus, body scales minute, embedded in the skin. Teeth in villiform bands in jaws, vomer, palatines and tongue. Maxillary and mandibular teeth consisting of several rows of which the outer row is composed of enlarged conical teeth, or reduced to a single series. Lateral line strongly curved anteriorly. Scutes on lateral line much larger than scales covering body, usually keeled posteriorly with spines. Dorsals 2, separate, spinous, with 7 connected weak spines, preceded by a single subcutaneous spine. Soft dorsal nearly equal to anal; in some genera one or more posterior rays of soft dorsal and anal detached as finlets. Pectorals long and

falcate. Ventrals thoracic, with one spine and five rays. Gillrakers normal in shape, sometimes transformed to long feather-like filaments.

Key to the Philippine genera of Caranginæ.

- a*¹. One or more finlets behind soft dorsal and anal.
 - b*¹. Several finlets behind soft dorsal and anal..... *Megalaspis*.
 - b*². One finlet behind soft dorsal and anal..... *Decapterus*.
- a*². No true finlets behind soft dorsal and anal.
 - b*¹. Dorsal spines present.
 - c*¹. Dorsal spines VII or VIII, connected by membrane. Scales small but apparent, not embedded in skin. Anterior rays of soft dorsal and anal not equalling length of body.
 - d*¹. Gillrakers of moderate length and normal shape..... *Caranx*.
 - d*². Gillrakers extremely long, featherlike, reaching into mouth. *Ulua*.
 - c*². Dorsal spines less than VII, rudimentary, not connected by membrane; scales not apparent, embedded in skin. Anterior rays of soft dorsal and anal at least equalling length of body. *Alectis*.
 - b*². Dorsal spines wanting. Scales totally absent. Anterior rays of soft dorsal and anal short *Hynnys*.

Genus MEGALASPIS Bleeker, 1851

- Megalaspis* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 417; Verh. Batav. Gen. 24 (1852) 24, 49.
Trachurus GRONOW, Cat. Fish. (1854) 124.

Body oblong-elongate, slightly compressed, covered with small scales. Head pointed, compressed. Jaws, vomer, palatines, and tongue toothed. Anterior and posterior adipose eyelids well developed. Anterior part of lateral line shortly arched, posterior portion with very high scutes. Spinous dorsal moderately high, preceded by a subcutaneous spine. Soft dorsal and anal about equal in size, with six to ten finlets. Pectorals long, falcate.

MEGALASPIS CORDYLA (Linnæus). Oriles. Plate 1, fig. 1.

- Scomber cordyla* LINNÆUS, Syst. Nat. Paris ed. 10 1 (1758) 298;
 BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 23.
Scomber rottleri BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 25.
Caranx rottleri RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 102; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1106; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 424; Fische der Südsee 2 (1876-1881) 130; DAY, Fishes of Malabar (1865) 80; Fishes of India. Text 1 (1878-1888) 213; Fauna of British India. Fishes 2 (1889) 150; KNER, Zool. Fische 1-3 (1865-1867) 150; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 58; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 453; ELERA, Cat. Syst. Fauna Filipinas.

- Vertebrados 1 Peces (1895) 509; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 155; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 239; VINCIGUERRA, Ann. Mus. Civ. Storia Nat. Genova 50 (1921-1926) 560; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77.
- Caranx rottleri* CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 22.
- Megalaspis rottleri* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342; 2 (1851) 213, 475; 3 (1852) 745; 8 (1855) 393, 398; 16 (1858-1859) 407; Verh. Bat. Gen. 24 (1852) 24, 49; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 53, 75; Ned. Tijdschr. Dierk. 4 (1873) 131; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 598.
- Megalaspis cordyla* JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 336; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 66; 77 (1925) 214; 79 (1927) 268; Copeia no. 58 (1918) 63; Mem. B. P. Bishop Mus. 10 (1928) 143; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 229; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 242; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; SEALE, Philip. Journ. Sci. § A 3 (1908) 517; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 147; OSHIMA, Philip. Journ. Sci. 26 (1925) 354; WHITLEY, Rec. Aust. Mus. 15 (1926-1927) 298; 17 (1929-1930) 121; BARNARD, Ann. South African Mus. 21 (1927) 533; JORDAN, EVERMANN, and TANAKA, Proc. Cal. Acad. Sci. 16 (1927-1928) 655; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 183; WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 193; HERRE, Notes on Fishes in the Zoological Museum of Stanford University (1934) 34; Field Museum Nat. Hist. Chicago 21 (1936) 110; HARDENBERG, Treubia 15 (1936) 246.

Head 4; depth 3.7 to 4; dorsals VIII, I, 10 (preceded by one procumbent spine); pectoral I, 21 or 22; ventral I, 5; anal II, I, 8 or 9; 50 to 58 strong scutes in straight lateral line, largest 2.3 to 2.6 in height of body; 8 or 9 dorsal finlets; ventral finlets 7. Lateral line well arched, straightening posteriorly below seventh dorsal spine.

Body subelongate, slightly compressed; dorsal and ventral contours even; greatest depth at base of soft dorsal and anal spines; dorsoventrally flattened from region below sixth dorsal finlet towards caudal base. Breast naked.

Head large. Rostradorsal profile weakly convex. Mouth terminal, oblique. Cleft of mouth slightly below eye. Maxillary broad posteriorly, terminating below center of eye. Lower jaw protruding beyond upper. Upper jaw with minute teeth in bands; two series anteriorly above symphysis, single row on each ramus of lower; vomer, palatines, and tongue with minute teeth. Chin slightly prominent. Snout short, 3.4 to 4.1 in

head. Eyes large, 3.5 to 4.2 in head, equal to snout. Adipose eyelid well developed, covering pupil anteriorly and posteriorly. Interorbital space convex, greater than eye, 3.4 to 3.8 in head. Seven branchiostegal rays. Gillrakers 20 to 23, flat and horny.

Spinous dorsal with a scaly groove, 2 to 2.4 in head. Spines long, third and fourth spines longest. Pectorals longer than head, 2.8 in standard length. Ventrals inserted below pectorals, 2.1 to 2.4 in head. Soft dorsal base nearly equal to anal, both with low basal sheath.

A dark spot on upper posterior part of opercle.

Above description based on specimen No. 10381, 346 mm long, collected from Aparri, Cagayan Province, Luzon, May 22, 1923.

LUZON, Bataan Province, Mariveles, No. 10169, 401 mm, April 24, 1922: Manila, Manila market, No. 273, 165 mm, June 14, 1907, No. 31955, 183 mm, October 7, 1930: Batangas Province, Nasugbu, Barrio Papaya, No. 13320, 330 mm, January 13, 1927: Camarines Sur, San Miguel Bay, No. 14822, 211 mm, July 11, 1924: Sorsogon Province, Bulan, No. 4156, 362 mm, 1904: Marinduque Province, Balanacan, No. 12907, 295 mm, February 25, 1925. PANAY, Iloilo Province, Estancia, No. 10850, 363 mm, July, 1922. CEBU, Cebu Province, Bantayan, No. 555, 315 mm, No. 20597, 310 mm, April, 1909. BOHOL, Bohol Province, Loay, No. 14734, 135 mm, No. 20648, 134 mm, November 20, 1926. MINDANAO, Davao Province, Davao, No. 3306, 198 mm, April 23, 1908: Zamboanga Province, Sangali, No. 31956, 103 mm. JOLO, Sulu Province, Jolo, No. 4112, 206 mm, 1904.

Genus DECAPTERUS Bleeker, 1851

Decapterus BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 417; Verh. Bat. Gen. 24 (1852) 24, 49.

Eustomatodus GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 261.

Evepigymnus GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 261.

Gymnepignathus GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 261.

Body elongate, more or less compressed-fusiform or subcylindrical. Head pointed, less compressed. Adipose eyelids well developed. Teeth fine, dentition various. Maxillary broadened posteriorly with a supplemental bone terminating before or below front border of eye. Dorsal fins distant; spinous fins with a procumbent anterior spine, and 8 free spines; soft dorsal with a spinelet and 27 to 35 rays. Anal with 2 detached anterior

spines and a spinelet connected with 23 to 30 rays. Dorsal and anal with a single finlet. Pectorals short, falcate, shoulder girdle crossed by a shallow furrow at its junction with the isthmus. Ventrals much shorter than pectorals, originating below base of pectorals. Caudal short, deeply concave, lobes acute. Lateral line slightly arched, passing over below soft dorsal into straight part which is wholly or partly provided with armed scutes. About 35 to 38 gillrakers on lower part of anterior arch.

DECAPTERUS MACROSOMA Bleeker. Galonggong. Plate 1, fig. 2.

Decapterus macrosoma BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342, 358; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 153; BARNARD, Ann. South African Mus. 21 (1927) 535; MCCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 184; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 197; NORMAN, Ann. & Mag. Nat. Hist. 16 (1935) 262.

Caranx macrosoma GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 425.

Decapterus macrosomus JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 337; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 63; OSHIMA, Philip. Journ. Sci. 26 (1925) 363; FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 269.

Head 3.9 to 4.1; depth 5.3 to 6.2; dorsals VIII, I, 31 to 33 (preceded by one procumbent spine); pectoral 21 to 23; ventral 6; anal II, I, 27 to 29; 52 to 62 scales in straight portion of lateral line, 26 to 29 of which are distinct scutes; caudal peduncle with one dorsal and one ventral finlet. Lateral line slightly arched anteriorly, straightening below tenth or eleventh soft dorsal ray.

Body elongate, subcylindrical, scarcely compressed, dorsal and ventral profiles almost equal; greatest depth at level of base of first soft dorsal ray and anterior spines of anal. Head pointed, its depth greater than its width. Profile from nape to snout arched to an angle of about 30°. Mouth terminal, slightly oblique. Cleft of mouth opposite eye. Maxillary terminating before front border of eye. Upper jaw toothless, lower with a single series of minute feeble teeth anteriorly. Vomerine teeth apparently absent. Palatines edentulous. Tongue triangular with a narrow strip of teeth at median posterior two-thirds. Upper lip with a thin transverse flap ventrally, concealing anterior portion of roof of mouth. Chin slightly prominent. Eyes large, 3.9 to 4.9 in head, almost equal to snout, situated mostly on anterior half of head. Adipose eyelid prominent. Anterior and posterior nostrils nearly confluent, posterior larger, midway between tip of snout and middle of upper border of

eye. Interorbital space equal to eye diameter. Operculum wide and carried anteriorly to a point below posterior border of maxillary. Opercle and preopercle scaled. Six branchiostegal rays, none visible externally. Gillrakers 35 to 38, filamentous and horny.

Scales minute, particularly so at interorbital space. Scales at infraorbital and postorbital large. Lateral line only slightly arched anteriorly, straightening below tenth or eleventh soft dorsal ray. Scales at posterior portion of straight lateral line modified scutes, the first commencing below twenty-fifth or twenty-sixth soft dorsal ray.

Spinous dorsal 1.9 in head. Spines slender, soft and pointed, third longest, shorter than base. Soft dorsal origin more advanced than anal, first ray longest. Pectorals about 2 in snout. Ventrals 2.8 in head, origin slightly posterior of that of pectorals. Base of anal 1.2 in that of soft dorsal.

LUZON, Manila, No. 31616, 297 mm, No. 31617, 269 mm, No. 31618, 235 mm, No. 31619, 275 mm, no date. SULU, Bongao, No. 20639, 277 mm, No. 20637, 381 mm, No. 20638, 300 mm, August 28, 1924.

Genus CARANX Lacépède, 1802

*Caranx*² (Commerson) LACÉPÈDE, Hist. Nat. Poiss. 3 (1802) 57.

*Trichopterus*³ RAFINESQUE, Caratteri Nuov. An. Sicil. (1810) 41.

*Carangus*⁴ GRIFFITH, The Class Pisces in Cuvier Animal Kingdom 10 (1834) 325.

*Selenia*⁵ (not Hubner, 1816) BONAPARTE, Cat. Method. Europei (1846) 75.

Leioglossus BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 418; Verh. Bat. Gen. 24 (1852) 29, 70.

Selaroides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 418; Verh. Bat. Gen. 24 (1852) 71.

Leptaspis BLEEKER, Verh. Bat. Gen. 24 (1852) 30, 71.

Carangichthys BLEEKER, Nat. Tijdschr. Ned. Ind. 3 (1852) 760; 3 (1855) 418.

Uraspis BLEEKER, Nat. Tijdschr. Ned. Ind. 8 (1855) 417, 418.

Paratractus GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 432.

Elaphrotoxon FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 76.

Vexillicaranx FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 76.

Longirostrum WAKIYA, Am. Carnegie Mus. 15 (1924) 164, 202.

²Jordan and Evermann, Genera of Fishes pts. 1-4 (1917-1920) 60.

³Ibid., p. 70.

⁴Ibid., p. 180.

⁵Ibid., p. 226.

- Leucoglossa* (Jordan and Evermann) JORDAN, EVERMANN, and TANAKA, Proc. Calif. Acad. Sci. (4) 16 (1927) 660.
Usa WHITLEY, Rec. Aust. Mus. (5) 15 (1927) 299.
Xurel JORDAN and EVERMANN, Proc. Calif. Acad. Sci. (4) 16 (1927) 505.
Carangulus JORDAN and EVERMANN, Proc. Calif. Acad. Sci. (4) 16 (1927) 505.
Elaphotoxon JORDAN, EVERMANN, and CLARK, Rep. U. S. Comm. Fish. pt. 2 [1928 (1930)] 271.
Usacarax WHITLEY, Aust. Zool. pt. 2 6 (1931) 316.
Zamora WHITLEY, Rec. Aust. Mus. (3) 18 (1931) 108.
Turrum WHITLEY, Rec. Aust. Mus. (6) 18 (1932) 337.

Body compressed, oblong, elongate or ovate, covered with small but conspicuous scales. Lateral line more or less arched anteriorly, posterior part straight with armed scutes in its entire length or confined only to posterior portion. Breast totally scaled or to some extent variably naked. Dentition complete or incomplete. Gillrakers normal in shape and of moderate length. First dorsal with 7 or 8 spines, connected by a membrane; anterior soft dorsal and anal rays elevated, forming a falcate lobe; some of the rays prolonged and filiform, but not equalling length of body. Soft dorsal and anal without finlets. Pectoral long, falciform, ventral usually shorter than head. Caudal with acute lobes. Shoulder girdle usually not crossed by a furrow at its junction with isthmus.

Key to the Philippine subgenera of Caranx.

- α^1 . Dentition complete, sometimes absent on tongue.
 b^1 . Teeth on lower jaw uniserial.
 c^1 . Upper jaw also uniserial, often pluseriate anteriorly; present on vomer, palatines, and usually on tongue. Adipose eyelid well developed. Soft dorsal and anal low, little if at all, falcate. Soft rays not produced into filaments. Shoulder girdle usually crossed with a deep furrow at its junction with isthmus.... *Selar*.
 c^2 . Teeth in upper jaw in a villiform band with an outer series of stronger teeth; with 2 to 4 more or less caniniform teeth anteriorly. Anterior rays of soft dorsal and anal forming a falcate lobe; no produced filaments..... *Caranx*.
 b^2 . Teeth on lower jaw in pluseriate band. Upper teeth also pluseriate, except some of anterior outer teeth, which are stronger; vomer, palatine, and tongue toothed. Adipose eyelid rudimentary. Anterior rays of soft dorsal and anal in adult more or less elevated, sometimes falcate; none of the rays filamentous..... *Carangoides*.
 α^2 . Upper jaw edentulous.
 b^1 . Lower jaw with a single series of minute teeth; more or less rudimentary on tongue..... *Selaroides*.
 b^2 . Teeth apparently absent on lower jaw in young; absolutely wanting in adult *Gnathanodon*.

Subgenus SELAR Bleeker, 1851

Selar BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 417; Verh. Bat. Gen. 24 (1852) 25, 50.

Body oblong, elongate, slightly compressed. Head pointed, lower jaw somewhat prominent or both jaws subequal. Adipose eyelid well developed. Teeth small, evenly uniserial in both jaws, although often pluriserial anteriorly in upper jaw; teeth persistent on vomer, palatines, and tongue. Lateral line strongly or moderately arched anteriorly, posterior portion straight, with armed scutes in its entire length or at least posteriorly. Soft dorsal and anal low, slightly elevated anteriorly. No dorsal and anal rays produced into a filament. Shoulder girdle crossed or not crossed with a deep furrow at its junction with isthmus.

Key to the Philippine species of Selar.

- a*¹. Last dorsal and anal ray finletlike, somewhat separated. Lateral line slightly arched anteriorly, becoming straight below sixth to eighth dorsal ray, with 43 to 47 scutes posteriorly..... *S. mate*.
- a*². Last dorsal and anal ray not finletlike, not separated.
 - b*¹. Eye 3 or less in head. Anterior eyelid narrow, posterior broad. Upper border of operculum with a rounded incision.
 - c*¹. Anterior portion of lateral line subhorizontal, curving downwards below level of last spinous dorsal spine. Posterior portion with 43 to 46 scutes..... *S. boops*.
 - c*². Anterior portion of lateral line poorly arched, straightening below level of eighth to tenth dorsal ray. Straight portion with 32 to 36 scutes..... *S. crumenophthalmus*.
 - b*². Eye 3 to 4 in head. Posterior adipose eyelid broad or narrow. Opercular border entire.
 - c*¹. Anterior portion of lateral line strongly arched, straightening below base of soft dorsal, with 43 to 57 scutes in straight portion.
 - d*¹. Shielded part of lateral line with 54 to 57 scutes. Maxillary terminating below anterior border of eye, or slightly beyond. Ventral profile subcarinate..... *S. malam*.
 - d*². Shielded portion of lateral line with 43 or 44 scutes. Maxillary terminating below first third of eye..... *S. djedaba*.
 - c*². Lateral line moderately arched anteriorly, becoming straight below fourth to sixth dorsal ray, with 40 or more scutes. Broadest scutes 6 to 7 times in depth of body. Maxillary terminating below first third of eye. Ventral profile more convex and trenchant *S. kalla*.

CARANX (SELAR) MATE Cuvier and Valenciennes. Plate 1, fig. 3.

Coranx mate CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 40; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1107; DAY, Fishes of Malabar (1865) 82; Proc. Zool. Soc. London (1870) 689; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 74; 79 (1927) 269; Mem. B. P. Bishop Mus. 10 (1928) 145; FOWLER and BEAN,

- Proc. U. S. Nat. Mus. Art. 2 62 (1923) 19; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors V fasc. 3 (1933) 58.
- Selar hasseltii* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 359; 2 (1851) 213; 3 (1852) 745; 8 (1855) 393, 398; Verh. Bat. Gen. 24 (1852) 26, 53; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 53, 75.
- Caranx affinis* RÜPPEL, Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 49; KNER, Zool. Fische 1-3 (1865-1867) 151; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 459; DAY, Fishes of India. Text 1 (1878-1888) 219; Fauna of British India. Fishes 2 (1889) 158; STEINDACHNER, Sitzungsber. Kaiserl. Akad. Wiss. Wien 83 (1881) 211; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 64; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 561; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77.
- Caranx hasseltii* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 430; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 59; WEBER, Semon, Zoologische Forschungreisen in Australien und dem Malayischen Archipel 5 (1895) 266; JORDAN and SEALE, Proc. U. S. Nat. Mus. 28 (1905) 776; Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; 26 [1906 (1907)] 13; FOWLER, Copeia No. 58 (1918) 63.
- Carangus politus* JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 445; JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 194.
- Carangus affinis* JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 446; SNYDER, Bull. U. S. Fish Comm. 22 [1902 (1904)] 523; BORODIN, Bull. Vanderbilt Mar. Mus. art. 1 1 (1928) 18.
- Decapterus lundini* JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 229.
- Selar affinis* JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 443; OSHIMA, Philip. Journ. Sci. 26 (1925) 380; BARNARD, Ann. South African Mus. 21 (1927) 538.
- Caranx affinis lundini* NICHOLS, Am. Mus. Novit. No. 50 (1922) 1.
- Atule lundini* JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 38.
- Caranx (Atule) affinis* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 200.
- Atule affinis* McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 190.
- Caranx (Selar) mate* WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 207.
- Atule mate* HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 7; Notes on fishes in the Zoological Museum of Stanford University (1934) 34.
- Alepes mate* FOWLER, Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 221.

Head 3.6 to 3.8; depth 3 to 3.2; dorsals VIII, I, 23 or 24 (preceded by one procumbent spine); pectoral 21 to 23; ventral I, 5; anal II, I, 19 or 20; 43 to 47 scutes in straight lateral line.

Body oblong, compressed; dorsal and ventral profile almost equally convex. Greatest depth at level of base of soft dorsal and that of first anal spine. Lateral line weakly arched, straightening posteriorly below sixth to eighth soft dorsal ray.

Head obtuse, longer than high. Rostronuchal outline declivous. Mouth terminal, its cleft opposite lower margin of eye. Maxillary triangular, terminating below or slightly beyond front border of eye. Teeth uniserial in both jaws, pluseriate anteriorly in upper; in narrow villiform band in vomer, palatines, and tongue. Snout equal to or greater than eye. Eye 3.4 to 3.7 in head. Adipose eyelid well developed. Interorbital greater than eye, quite convex transversely, with a slight median frontonuchal keel. Nostrils slitlike at anterior tip of frontal, posterior larger. Scales larger in postorbital; smaller in cheeks and upper portion of opercle. Rows of minute mucous canals traversing almost entire length of preopercle. Operculum wide, extending anteriorly below level of anterior border of eye. Gillrakers 26 or 27, at times as many as 31.

Spinous dorsal with a base 2 in head. Spines weak, pointed, fourth longest. Soft dorsal origin more advanced than anal. Pectorals falcate, longer than head. Ventrals short, 2.3 in head, concealing vent when depressed. Both soft dorsal and anal with scaly basal sheath, that of spinous dorsal less developed.

Six black transverse bands, faintly indicated; a large dark blotch on posterior margin of opercle and upper portion of shoulder girdle. Alcoholic specimens vinaceous-brown above and silvery below.

The above description is based on specimen No. 12357, collected from San Pedro Bay, Basey, Samar, September 17, 1925. Length, 150 millimeters.

LUZON, Manila market, No. 96, 134 mm, No. 97, 123 mm, June 1, 1907, No. 6916, 235 mm, October 12, 1911: Batangas Province, Balayan Bay, No. 2269, 112 mm, No. 2276, 197 mm: Albay Province, Legaspi, No. 20731, 139 mm, No. 20732, 143 mm, September 21, 1924. POLILLO ISLANDS, No. 12594, 218 mm, September 25, 1925. SAMAR, Calbayog, No. 15063, 192 mm, No. 20551, 184 mm, December 8, 1926, No. 14974, 191 mm, No. 20776, 192 mm, No. 20777, 181 mm, December 17, 1926; San Pedro Bay, Basey, No. 12357, 150 mm, September 17, 1925. LEYTE, Bu-rauen, No. 15060, 153 mm, December 3, 1926; Cabalian, No. 9641, 227 mm, May 25, 1921. MINDANAO, Zamboanga Province,

Zamboanga, No. 4271, 159 mm, No. 20749, 150 mm, June 2, 1908.

Foreign example: Honolulu, Hawaii, No. 7492, 124 mm, no date.

CARANX (SELAR) BOOPS Cuvier and Valenciennes. Plate 2, fig. 1.

Caranx boops CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 35; GÜNTHER, Cat. Fish Brit. Mus. 2 (1860) 431; BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 235; DAY, Fishes of India. Text 1 (1878-1888) 218; Fauna of British India. Fishes 2 (1889) 157; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 24; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 63; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 395.

Selar boops BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 3 (1852) 740, 745; 8 (1855) 393, 398; Verh. Bat. Gen. 24 (1852) 26, 51; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 79 (1927) 269; Mem. B. P. Bishop Mus. 10 (1928) 144; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 190; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 34.

Caranx freeri EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 63.

Caranx (Selar) boops WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 209.

Head 3 to 3.3; depth 3.1 to 3.2; dorsals VIII, I, 24 (preceded by one procumbent spine); pectorals 20 to 21; ventrals 5; anal II, I, 20; posterior lateral line scutes 43 to 46, 40 to 42 in straight portion.

Body oblong, dorsal and ventral profiles equally convex; greatest depth at level of base of soft dorsal and that of first preanal spine. Lateral line very slightly arched, posterior portion straightening below spine of soft dorsal. Highest scute 4.1 to 4.5 in body height.

Head pointed, its length greater than its depth. Mouth terminal, its cleft opposite lower margin of lens of eye. Maxillary broadly triangular, extending to below middle of eye. Lower jaw more prominent than upper; teeth in a single series in both jaws; in three elongate patches in vomer; in bands in palatines and tongue. Snout equal to or less than interorbital. Eyes very large, 2.8 to 3 in head. Adipose eyelid well developed, anterior and posterior portions almost coalescing at center of eye. Opercle with an upper posterior notch. Operculum wide, extending anteriorly below level of front border of eye. Shoulder girdle crossed by a furrow at its junction with isthmus. Gillrakers 26.

Spinous dorsal with a base 2.4 in head. Spines weak, second longest. Origin of soft dorsal slightly ahead of anal. Soft dorsal and anal with scaly basal sheath, penultimate ray quite apart from rest, thus appearing finletlike. Pectorals falcate, shorter than head. Reaching a point midway between base of free anal spines and that of soft dorsal. Ventrals inserted behind pectorals. Soft dorsal base 1.1 in anal base.

A small dark blotch along upper concavity of opercle.

This description is based on No. 3895, collected from Samal Island, Davao, May 3, 1908. Total length, 187 millimeters.

This species differs from *Caranx (Selar) mate* Cuvier and Valenciennes in having relatively larger eyes and conspicuously large scutes in the posterior lateral line.

POLILLO, No. 20622, 167 mm, September 25, 1925. SAMAR, Catbalogan, No. 31793, 169 mm, March 5, 1932. PANAY, Iloilo Province, No. 20704, 154 mm, February 8, 1925. PALAWAN, Puerto Princesa, No. 5460, 121 mm, No. 20558, 118 mm, August 21, 1908. CULION, No. 11409, 107 mm, No. 20712, 100 mm, December 16, 1921. MINDANAO, Misamis Oriental Province, No. 1757, 100 mm, September 17, 1907; Zamboanga Province, Zamboanga, No. 4144, 230 mm, May 23, 1908, No. 4102, 188 mm, May 21, 1908. SAMAL, Davao Province, No. 3895, 187 mm, May 3, 1908, No. 3625, 175 mm, May 1, 1908, No. 3810, 220 mm, May 2, 1908. SULU, Bungau, No. 13537, 266 mm; No. 13559, 272 mm; No. 20618, 240 mm; No. 20619, 262 mm; No. 20620, 253 mm, April 9, 1926.

CARANX (SELAR) CRUMENOPHTHALMUS (Bloch). *Matang baca*. Plate 2, fig. 2.

Scomber crumenophthalmus BLOCH, Ichthyol. Hist. Nat. Poiss. pt. 10 (1797) 65.

Scomber plumierii BLOCH, Ichthyol. Hist. Nat. Poiss. pt. 10 (1797) 67; BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 30.

Scomber balantiophthalmus BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 29.

Caranx mauritianus QUOY and GAIMARD, Voyage autour du monde. Paris (1824) 359; CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 45.

Caranx macrophthalmus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 97; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 458.

Caranx crumenophthalmus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 46; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 429; Fische der Südsee 2 (1876-1881) 131; BLEEKER, Nat. Verh. Holl. Maatsch. (2) 18 (1863) 14; DAY, Fishes of India. Text 1 (1878-1888) 217; Fauna of British India. Fishes 2 (1889) 156; JORDAN and GILBERT, Proc. U. S. Nat. Mus. 6 [1883 (1884)] 196; MEYER,

- Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 660; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 327; PELLEGRIN, Bull. Soc. Zool. France 37 (1912) 291; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 398; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77.
- Selar torvus* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 2 (1851) 210, 213; 3 (1852) 745; 8 (1855) 393, 398; Verh. Bat. Gen. 24 (1852) 25, 51; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 162.
- Caranx torvus* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 431; BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 235, 242.
- Carangus crumenophthalmus* GOODE, Bull. U. S. Fish Comm. 1 [1881 (1882)] 33.
- Trachurops crumenophthalmus* GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 432; JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 911; Rept. U. S. Fish Comm. 21 [1895 (1896)] 345; JENKINS, Bull. U. S. Fish. Comm. 22 [1902 (1904)] 443; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 69; SEALE, Occ. Pap. B. P. Bishop Mus. 4 (1906) 30; OSHIMA, Philip. Journ. Sci. 26 (1925) 369; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 81.
- Trachurops torvus* JORDAN and SNYDER, Proc. U. S. Nat. Mus. 23 (1901) 352.
- Trachurops crumenophthalma* SNYDER, Bull. U. S. Fish Comm. 22 [1902 (1904)] 523; JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 187; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 230; 26 [1906 (1907)] 13; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 268; BORODIN, Bull. Vanderbilt Mar. Mus. art. 1 1 (1928) 18; JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 271.
- Trachurops torva* JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 337.
- Selar crumenophthalmus* FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 77 (1925) 214; 79 (1927) 269; Mem. B. P. Bishop Mus. 10 (1928) 144; Bull. Amer. Mus. Nat. Hist. pt. 2 70 (1936) 689; Monog. No. 2 Acad. Nat. Sci. Phila. (1933) 220, 254; BARNARD, Ann. South African Mus. 21 (1927) 536; HERRE, Journ. Pan-Pacific Res. Inst. (2) 10 (1935) 164.
- Selar mauritianus* JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 38; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 159.
- Selar macrophthalmus* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 160; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 8; Notes on fishes in the Zoological Museum of Stanford University (1934) 34.
- Trachurops mauritiana* JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 18.
- Caranx (Selar) crumenophthalmus* WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 210.
- Trachurops macrophthalmus* HERRE, Field Mus. Nat. Hist. Chicago 21 (1936) 112.

Head 3 to 3.1; depth 3.2 to 3.4; dorsals VIII, I, 25 (preceded by a procumbent spine); pectoral 19 to 21; ventral I, 5; anal II, I, 22; 32 to 36 scutes in straight lateral line, highest 6.8 to 7.5 in body height.

Body elongate, dorsal and ventral outlines almost equally convex; greatest depth at level of base of soft dorsal and that of anal. Lateral line barely curved, straightening posteriorly below level of eighth to tenth dorsal rays.

Head pointed, about as long as high. Mouth terminal, its cleft opposite lower margin of eye. Maxillary triangular, terminating below anterior margin of lens of eye. Teeth uniserial in both jaws, in triaxial patches in vomer, in narrow patches in palatines and tongue. Snout shorter than eye; eye quite large, 3 in head; interorbital less than snout. Adipose eyelid well developed, posterior portion broader. Nostrils nearer eye than tip of snout. Infraorbital prominent, longer than eye. Cheek, postorbital, and upper opercle scaled. Preopercle convex. Operculum wide and carried forward below anterior border of eye. A deep narrow groove at junction of shoulder girdle with isthmus. Gillrakers 27 or 28.

Spinous dorsal with a base 2.3 to 2.5 in head. Spines weak, third longest. Soft dorsal origin slightly advanced to that of anal. Soft dorsal and anal with scaly basal sheath. Pectoral falcate, shorter than head. Ventral inserted below pectoral, its tips reaching vent. Base of soft dorsal 1.10 in that of anal.

A small, dark, opercular spot; spinous dorsal, soft dorsal, anal, and caudal with numerous tiny spots.

The above description is based on No. 12462, collected from Malangas, Zamboanga Province, September 5, 1925. Total length, 154 millimeters.

This species closely resembles *Caranx (Selar) boops* Cuvier and Valenciennes, except for the more elongate body, and the fewer and less developed scutes.

LUZON, Ilocos Sur Province, Bangui, No. 14313, 142 mm, No. 20643, 144 mm, August 19, 1926: Bataan Province, Orion, No. 31361, 193 mm, November 23, 1934: Manila market, No. 938, 160 mm, No. 21611, 157 mm, September, 1907, No. 52, 168 mm: Sorsogon Province, Bulan, No. 3346, 138 mm, 1904. MINDORO, Mindoro Province, Calapan, No. 31478, May 1, 1933. NEGROS, Negros Oriental Province, Tolong, No. 13887, 164 mm, No. 20717, 162 mm, February 28, 1926. PALAWAN, Palawan Province, Puerto Princesa, No. 5454, 120 mm, August 2, 1908,

No. 5456, 145 mm, August 21, 1908. CAMIGUIN, No. 585, 122 mm, No. 589, 117 mm, July, 1907. MINDANAO, Oriental Misamis Province, Cagayan, No. 1623, 216 mm, September 13, 1907; Zamboanga Province, Zamboanga, No. 20703, 176 mm, June 3, 1908; Malangas, No. 12462, 189 mm, September 5, 1925. JOLO, Sulu Province, No. 2394, 141 mm, February, 1908.

CARANX (SELAR) MALAM Bleeker. Plate 2, fig. 3.

Selar malam BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 362; 2 (1851) 471; Verh. Bat. Gen. 24 (1852) 27, 55; Versl. Akad. Amsterdam 12 (1861) 53.

Caranx malam GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 434; KNER, Zool. Fische 1-3 (1865-1867) 154; BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 116, 131; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 600; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 397; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 188.

Caranx nigripinnis DAY, Fishes of India. Text 1 (1878-1888) 225; Fauna of British India. Fishes 2 (1889) 168; JORDAN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 14.

Alepes melanoptera FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 70; 79 (1927) 269.

Caranx (Atule) malam WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 200.

Caranx (Selar) malam WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 213.

Atule malam HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 34.

Head 3.9; depth 3.1 to 3.4; dorsals VIII, I, 25 (with one procumbent spine); pectoral I, 22; anal II, I, 21; scutes 54 to 57 in a straight lateral line.

Body oblong, dorsal and ventral outline equally convex. Mouth terminal, its cleft oblique. Jaws nearly equal. Maxillary terminating slightly beyond front border of eye. Teeth in jaws in single series, small but conspicuous, a few on vomer, minute in palatines and tongue. Snout somewhat blunt, equal to eye diameter. Eye large, 3.7 to 4 in head. Adipose eyelid moderately developed, covering pupil posteriorly. Interorbital space convex, greater than eye. Opercular wide. Angle of mouth, postorbital, upper portions of preopercular and opercular scaled. Gillrakers 24 or 25, short and blunt.

Spinous dorsal with a base 1.93 to 1.98 in head. Spines weak, fourth longest, flexible in a groove. Base of soft dorsal 2.3 in standard length, its rays gradually decreasing in length posteriorly. Pectorals falcate, longer than head, extending beyond

vertical through origin of anal. Anal base shorter than that of soft dorsal. Caudal widely forked, 3.9 in total length.

The alcoholic specimens brownish above, with a light-purplish tint, silvery below. Upper opercle with a dusky spot.

Above description is based on specimen No. 10197, 410 mm, collected from Monja Island, Corregidor, April 24, 1922.

LUZON, Corregidor, Monja Island, No. 20576, 432 mm, April 28, 1922. PALAWAN, Palawan Province, No. 31304, 265 mm, October, 1930.

CARANX (SELAR) DJEDABA (Forskål). Salay-salay lalaki. Plate 3, fig. 1.

Scomber djedaba FORSKÅL, Descriptiones Animalium. Pisces (1775) 56.

Caranx djeddaba RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 97; CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 38; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 432; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 59; DAY, Proc. Zool. Soc. London (1870) 689; Fishes of India. Text 1 (1878-1888) 218; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 458; BOULENGER, Proc. Zool. Soc. London (1887) 660; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 (1908) 250; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 242; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 79 (1927) 270; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 562; HORA, Mem. Asiat. Soc. Bengal (2) 6 (1924) 435; BARNARD, Ann. South African Mus. 21 (1927) 546.

Caranx vari CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 36; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1107.

Selar djeddaba BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; Versl. Akad. Amsterdam 12 (1861) 75; OSHIMA, Philip. Journ. Sci. 26 (1925) 379.

Selar vari BLEEKER, Verh. Bat. Gen. 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 75.

Caranx djedaba DAY, Fauna of British India. Fishes 2 (1889) 158; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 599.

Caranx (Atule) djeddaba WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 199.

Caranx (Selar) djedaba WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 214.

Head 3.3 to 3.8; depth 2.8; dorsals VIII, I, 24 (with a procumbent spine); pectoral I, 20 or 21; anal I, 19 to 20. Scutes, 43 to 44 in a straight lateral line.

Body oblong, dorsal and ventral outline evenly convex. Mouth terminal, its cleft oblique, extending to front margin of eye. Lower jaw slightly prominent, maxillary terminating be-

low first third of eye. Uniserial fine teeth in jaws, a patch in vomer, a narrow band on palatines and tongue. Snout pointed, about equal to eye. Eye 3.6 to 4 in head. Adipose eyelid well developed, occupying posterior half of eye. Interorbital space narrower than eye diameter. Opercular wide, extending to below level of anterior margin of eye. Gillrakers 29 (31).

Spinous dorsal base 2 in head. Spines moderately strong, third slightly the longest. Base of soft dorsal 2.1 in standard length. Anterior rays high, decreasing in length posteriorly. Pectorals long, falciform, longer than head. Anal base 2.4 in standard length. Soft dorsal and anal with low basal membrane.

Alcoholic specimens vinaceous brown above, whitish below. A dusky spot in upper border of opercle.

Here described from specimen No. 31917, 187 mm long, collected from Divisoria Market, Manila, Luzon, Philippines.

PANAY, Iloilo Province, Estancia, No. 20633, 223 mm, June 16, 1922.

Foreign example: China, Hongkong, No. 7761, 167 mm.

CARANX (SELAR) KALLA Cuvier and Valenciennes. Salay-salay aso. Plate 3, fig. 2.

Caranx kalla CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 37; DAY, Fishes of Malabar (1865) 83; Fishes of India. Text 1 (1878-1888) 219; Fauna of British India. Fishes 2 (1889) 160; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; JORDAN and SEALE, Proc. Davenport Acad. Sci. 10 (1907) 6; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 599; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 398; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 77 (1925) 215; 79 (1927) 270; Mem. B. P. Bishop Mus. 10 (1928) 148; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 560; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 185; CHEVEY, Inst. Oceanog. l'Indochine (1932) 26; Trav. l'Inst. Oceanog. l'Indochine 4^e Memoire (1932) 110.

Caranx xanthurus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 41; KNER, Zool. Fische 1-3 (1865-1867) 154.

Caranx cambon CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 45.

Caranx parra BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 346.

Selar kuhlii BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 360; 2 (1851) 210, 213; 3 (1852) 740, 745; 8 (1855) 393, 398; Verh. Bat. Gen. 24 (1852) 26, 54; Versl. Akad. Amsterdam 12 (1861) 53, 75.

Selar brevis BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 361; Verh. Bat. Gen. 24 (1852) 27, 54.

Selar para BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 16 (1858-1859) 407; Verh. Bat. Gen. 24 (1852) 27, 56; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 53.

- Selar kalla* BLEEKER, Verh. Bat. Gen. 25 (1853) 44; BARNARD, Ann. South African Mus. 21 (1927) 537.
- Caranx calla* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 433; BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 131; DAY, Proc. Zool. Soc. London (1870) 689; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 509; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 243; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250.
- Caranx brevis* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 435; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; SEALE, Philip. Journ. Sci. § D 5 (1910) 271.
- Caranx para* DAY, Fishes of Malabar (1865) 85; KNER, Zool. Fische 1-3 (1865-1867) 153.
- Alepes kalla* OGILBY, Mem. Queens. Mus. 3 (1915) 62.
- Selar calla* JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 443.
- Caranx kuhlii* JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 16; FOWLER, Mem. B. P. Bishop Mus. 10 (1928) 145.
- Caranx (Selar) kalla* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 216; HARDENBERG, Treubia 15 (1936) 246.
- Atule kalla* HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 3; Notes on fishes in the Zoological Museum of Stanford University (1934) 34.

Head 3.5 to 3.7; depth 2.3 to 2.5; dorsals VIII, I, 25 (with one procumbent spine); pectoral I, 20; anal II, I, 20; scutes 40 to 41 in straight lateral line commencing below fourth to sixth ray of soft dorsal.

Body ovate, tapering posteriorly, ventral contour much more convex than dorsal and sharp till anal. Mouth terminal, its cleft oblique, terminating below front border of eye. Maxillary reaching first third of eye. Jaws subequal, lower jaw slightly prominent. Teeth even, conical, in single series in both jaws, in triangular patch on head of vomer, in narrow band in palatines, and in broad band on tongue. Snout blunt and short, 1.4 in eye. Eye large, 2.8 to 2.9 in head. Adipose eyelid poorly developed, not reaching pupil of eye. Interorbital gently convex and low, 1.2 in eye diameter. Preopercular border entire. Opercular opening extending anteriorly to below level of nostrils. Gill-rakers 28 to 30, slender.

Spinous dorsal base 2 in head. Spines weak and flexible, third, fourth, and fifth spines longest. Base of soft dorsal 2.2 to 2.3 in length. First six rays of soft dorsal slightly produced, gradually shortening posteriorly, first ray extending to ninth ray when depressed. Pectorals longer than head. Anal base 2.4 to 2.5 in standard length, first ray originating below fourth ray of soft dorsal. Caudal deeply forked, upper lobe longer.

Alcoholic specimens yellowish brown above, silvery below, a large blackish spot on shoulder, encroaching well on upper edge of opercle. Base of pectoral and ventral washed with dull gold.

Here described from specimen No. 9636, 152 mm, collected from Cabalian, Leyte, May 14, 1921.

LUZON, Manila Bay, No. 10920, 119 mm, No. 20741, 120 mm, No. 20739, 120 mm, No. 20736, 122 mm, No. 20742, 116 mm, No. 20737, 126 mm, April 21, 1923; Divisoria Market, No. 31928, 129 mm, No. 31929, 127 mm, January 8, 1931: Camarines Sur Province, San Miguel Bay, No. 14823, 113 mm, July 11, 1924; Calabañga, No. 31930, 156 mm, No. 31931, 105 mm, No. 31932, 124 mm, No. 31933, 152 mm, No. 31934, 138 mm. SAMAR, Samar Province, Calbayog, No. 15007, 145 mm, No. 20705, 136 mm, December 18, 1926. PANAY, Capiz Province, Capiz, No. 20724, 142 mm, No. 20727, 141 mm, No. 20726, 139 mm, No. 20725, 152 mm, July 30, 1925.

Subgenus CARANGOIDES Bleeker, 1815

Carangoides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 418; Verh. Bat. Gen. 24 (1852) 27, 59.

Body oblong or ovate. Breast scaly, or ventrally and laterally naked to some extent. Adipose eyelid rudimentary. Lateral line moderately curved anteriorly, straight portion armed posteriorly. Upper and lower jaws with pluriserial band of small teeth, except for a few stronger teeth anteriorly. Anterior rays of soft dorsal and anal more or less elevated, sometimes falcate in adult; none of the rays filiform.

Key to the Philippine species of *Carangoides*.

- α^1 . Persistent dentition on jaws, vomer, palatines, and tongue.
 - b^1 . Breast totally scaled, except for a median naked area ventrally.
 - Anterior rays of soft dorsal and anal not elevated into a lobe. Scales more or less conspicuous.
 - c^1 . Lateral line straightening below eleventh to thirteenth ray of soft dorsal. Dorsals VIII, I, 22 to 26, anal II, I, 19 to 23.
 - d^1 . Dorsals VII, I, 22 to 24; anal II, I, 19 or 20, 12 or 13 scutes posteriorly *C. compressus*.
 - d^2 . Dorsals VIII, I, 25 or 26; anal II, I, 19 or 20, 15 to 20 feeble scutes posteriorly *C. auroguttatus*.
 - c^2 . Lateral line straightening below eighth ray of soft dorsal. Dorsals VIII, I, 23 or 24; anal II, I, 19 or 20, 25 to 30 scutes on posterior part of lateral line *C. præustus*.
 - b^2 . Breast naked.
 - c^1 . Naked area not reaching base of pectorals. Cleft of mouth below level of eye. Dorsals VIII, I, 26 to 28; anal II, I, 22 to 24.

- Lateral line straightening below fifteenth ray of soft dorsal;
15 to 20 scutes posteriorly..... *C. fulvoguttatus*.
- c². Naked area extending to or surpassing base of pectorals and ventrals.
- d¹. Cleft of mouth opposite eye or its lower border.
- e¹. Dorsals VII or VIII, I, 30 or 31; anal II, I, 25 or 26. Lateral line straightening below twenty-fourth ray of soft dorsal; 23 to 25 scutes..... *C. gymnostethoides*.
- e². Dorsals VIII, I, 20 or 21; anal II, I, 16 or 17. Lateral line straightening below thirteenth ray of soft dorsal; 20 feeble scutes *C. armatus*.
- d². Cleft of mouth below level of eye.
- e¹. Dorsals VIII, I, 21 or 22; anal II, I, 18 to 20. Straight lateral line commencing below level of seventh ray of soft dorsal. 36 to 40 scutes..... *C. oblongus*.
- e². Dorsals VIII, I, 21 to 23; anal II, I, 18 or 19. Lateral line becomes straight below twelfth ray of soft dorsal.
- f¹. Twenty scutes in posterior portion of lateral line. Gillrakers 15 or 16..... *C. chrysophrys*.
- f². Twenty-one to 28 scutes in posterior part of lateral line. Gillrakers 25 or 26..... *C. malabaricus*.
- α². Dentition not persistent. Teeth on jaws becoming uniserial; teeth on vomer, palatines, and tongue disappearing with age. Dorsals VIII, I, 18 to 21; anal II, I, 17 or 18. Breast ventrally, and partially also laterally, naked. Straight lateral line beginning below level of twelfth ray of soft dorsal; 23 to 25 scutes..... *C. dinema*.

CARANX (CARANGOIDES) COMPRESSUS Day. Plate 3, fig. 3.

Caranx ferdau RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 99; CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 42; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 439.

Caranx compressus DAY, Proc. Zool. Soc. London (1870) 689; Fishes of India. Text 1 (1878-1888) 221; Fauna of British India. Fishes 2 (1889) 161; BORODIN, Bull. Vanderbilt Mar. Mus. art. 2 1 (1930) 49; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Caranx brevicarinatus KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 461.

Caranx (Carangoides) ferdau WAKEIYA, Ann. Carnegie Mus. 15 (1923-1924) 165.

Caranx (Carangoides) compressus WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 223.

Head 3.3; depth 2.5; dorsals VIII, I, 24 (with one procumbent spine); pectoral I, 19; anal II, I, 20; lateral line arched anteriorly, straightening below thirteenth ray of soft dorsal, with 13 small scutes that form a carina on caudal peduncle.

Body oblong, elongate, compressed, dorsal and ventral profiles equally convex. Head large, its rostrum-occipital outline convex.

Mouth oblique, its cleft opposite lower third of eye. Maxillary triangularly broad posteriorly, terminating beyond front border of eye. Lower jaw projecting strongly beyond upper. Teeth minute, in bands on jaws, palatines, vomer, and tongue. Pre-orbital slightly longer than eye. Snout somewhat pointed, 3.3 in head. Eye 3 in head. Adipose eyelid poorly developed, a mere rim around eye socket. Interorbital space less than snout. Cheeks, postorbital, preopercle, upper opercle, and nuchal region scaly. Opercular opening extending anteriorly below level of posterior nostrils. Gillrakers 22, slender, increasing in length posteriorly. Breast scaled, except for a very narrow naked area ventrally.

Spinous dorsal with a base 7.2 in body length. Spines weak, fourth spine longest. Soft dorsal inserted closer to caudal base than to tip of snout. Pectorals longer than head. Anal origin below level of fifth ray of soft dorsal. Soft dorsal and anal with low scaly sheaths, whose anterior rays are quite elevated. Caudal forked broadly.

Alcoholic specimens sorghum-brown dorsally, pale olive-gray ventrally. Five vinaceous buff crossbars on sides, not extending to ventral contour. Opercular spot and margin of preopercular dusky.

Above description based on specimen No. 13350, 207 mm, collected from Bennett Island, Masbate, March 27, 1926.

BANTAYAN, Cebu Province, No. 20728, 275 mm, December 25 to 28, 1926. CANIPO, Palawan Province, No. 15504, 275 mm, No. 20775, 195 mm, June 19, 1927.

CARANX (CARANGOIDES) AUROGUTTATUS Cuvier and Valenciennes. Plate 4, fig. 1.

Caranx fulvoguttatus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 100; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 439; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 460.

Caranx auroguttatus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 54; BOULENGER, Proc. Zool. Soc. London (1887) 660; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Carangoides aureoguttatus BLEEKER, Versl. Akad. Amsterdam 12 (1861) 53.

Caranx (Carangoides) auroguttatus WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 225.

Head 3.5; depth 2.4; dorsals VIII, I, 25 (with one procumbent spine); pectoral I, 20; anal II, I, 22; lateral line arched anteriorly, straightening below the eleventh ray of soft dorsal with 20 scutes posteriorly.

Body oblong, elongate, dorsal profile convex, ventral profile less so. Head longer than high, rostrofrontal outline somewhat protruding anteriorly. Mouth oblique. Maxillary broad posteriorly, not reaching front border of eye. Lower jaw slightly longer than upper. Teeth small, pluriserial in both jaws, minute, villiform bands in vomer, palatines, and tongue. Posterior part of preorbital less than eye diameter. Snout somewhat pointed, 2.4 in head. Eye 4.1 in head length, situated on middle of head above longitudinal axis of body. Adipose eyelid poorly developed. Interorbital with a prominent fronto-occipital ridge, less than snout. Cheek, postorbital, upper opercular, nuchal region, and interopercle scaled. Opercular opening wide, extending anteriorly below level of posterior border of nostrils. Gillrakers 19, first rudimentary. Breast scaled, except for a small, narrow, naked area in median line.

Spinous dorsal with a base 5.7 in standard length, spines weak, thirteenth spine longest, 3.4 in body depth. Soft dorsal inserted nearer caudal base than snout tip. Pectorals longer than head, extending posteriorly to second ray of anal when depressed. Ventral origin below pectoral base, longer than snout. Anal originating below level of third ray of soft dorsal. Anterior rays of soft dorsal and anal elevated. Caudal forked.

Alcoholic specimens vetiver-green above, deep colonial-buff below, all fins tawny-olive.

Here described from specimen No. 15557, 295 mm long, collected from Calapan, Mindoro Province, June 19, 1927.

MINDORO, Mindoro Province, Calapan, No. 20562, 278 mm, June 19, 1927.

CARANX (CARANGOIDES) PRÆEUSTUS Bennett. *Salay-salay*. Plate 4, fig. 2.

Caranx ire CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 43; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 436; DAY, Fishes of India. Text 1 (1878-1888) 220; Fauna of British India. Fishes 2 (1889) 160; JORDAN and SEALE, Proc. U. S. Nat. Mus. 28 (1905) 776; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; SEALE, Philip. Journ. Sci. § D 5 (1910) 271; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 599.

Carangoides præeustus BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 363; 2 (1851) 471; Verh. Bat. Gen. 24 (1852) 27, 60; 25 (1853) 46; Versl. Akad. Amsterdam 12 (1861) 53.

Selar ire BLEEKER, Verh. Bat. Gen. 25 (1853) 44; JORDAN and STARKS. Ann. Carnegie Mus. 11 (1917) 443.

Caranx præeustus GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 436; Fische der Südsee 2 (1876-1881) 134; FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 271; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 3, 7.

Caranx melanostethos DAY, Proc. Zool. Soc. London (1865) 23; Fishes of Malabar (1865) 83.

Caranx (*Carangoides*) *præustus* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 224; HARDENBERG, Treubia 15 (1936) 247.

Head 3; depth 2.7; dorsal VIII; soft dorsal, I, 22 (with one procumbent spine); pectoral, I, 19; anal II, I, 20; lateral line arched anteriorly, becoming straight below level of eighth ray of soft dorsal, with 27 small scutes posteriorly.

Body oblong, compressed; dorsal profile more convex than that of ventral. Head a little longer than high, its rostrifrontal portion ascending in nearly straight line. Mouth oblique, its cleft opposite lower border of eye. Maxillary quite broad posteriorly, terminating below anterior third of eye. Teeth in villiform bands in jaws; in upper jaw somewhat enlarged anteriorly; in a semilunar patch in head of vomer with narrow median patch posteriorly; in narrow bands in palatines and tongue. Snout pointed, equal to eye. Preorbital less than eye. Eye 3.5 in head, situated more on anterior half of head. Adipose eyelid poorly developed. Interorbital equal to snout. Cheeks, postorbital nuchal region, and upper opercular scaled. Opercular opening wide, extending anteriorly below level of front border of eye. Gillrakers 24. Breast entirely scaled, except a minute anterior naked patch ventrally.

Spinous dorsal base 5.4 in standard length. Spines weak, depressible in a groove, third spine longest. Soft dorsal origin closer to caudal base than to tip of snout. Pectorals falcate, shorter than head. Ventrals short, 2.7 in head. Anal inserted below level of third ray of soft dorsal. Soft dorsal and anal with high basal scaly sheath. Caudal lobes equal.

Alcoholic specimens deep brownish drab above, olive-buff below. Anterior portion of soft dorsal with blackish patch.

Here described from No. 739, 80 mm, collected from Malabon, Rizal, July 18, 1907.

Other examples: Sandakan, Borneo, No. 2613, 120 mm, No. 2738, 130 mm, February, 1908, No. 14173, 151 mm, November 21, 1925.

CARANX (CARANGOIDES) FULVOGUTTATUS (Forskål). Plate 4, fig. 3.

Scomber fulvo-guttatus FORSKÅL, Descriptiones Animalium. Fishes (1775) 56.

Caranx fulvoguttatus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 57; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Carangoides fulvoguttatus BLEEKER, Nat. Tijdschr. Ned. Ind. 2 (1851) 178; Verh. Bat. Gen. 24 (1852) 89.

Caranx bleekeri KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 461; BAMBER, Journ. Linn. Soc. London 31 (1907-1915) 480.

Caranx (*Carangoides*) *fulvoguttatus* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 227.

Head 3.2; depth 2.5; dorsals VIII, I, 26 (with one procumbent spine); pectoral I, 20; anal II, I, 23; lateral line arched anteriorly, straightening below fifteenth dorsal ray; 15 small scutes posteriorly.

Body oblong, dorsal profile convex, ventral profile almost straight from isthmus to base of anal, thence acclivous to caudal peduncle. Head almost as long as high, fronto-occipital outline convex. Mouth oblique. Maxillary broad, terminating in front of anterior border of eye. Jaws almost equal. Teeth minute, in villiform bands in jaws, vomer, palatines, and tongue. Snout pointed, 2.5 in head length. Posterior part of preorbital less than eye. Eye 3.9 in head. Adipose eyelid poorly developed. Interorbital space greater than eye, somewhat convex, with a fronto-occipital keel. Cheeks, postorbital, upper opercular, and nuchal region with scales. Gill opening wide, extending anteriorly below level of nostrils. Gillrakers 19, set quite wide apart on lower anterior arch, first gillrakers rudimentary. Naked area of breast extending laterally upwards midway between ventral line and base of pectorals, and continued posteriorly to about middle of ventral.

Spinous dorsal base 6.7 in standard length. Spines weak, third spine longest. Origin of soft dorsal closer to middle of caudal peduncle than to tip of snout. Pectorals falcate, longer than head. Ventrals abdominal, equal to snout. Anal inserted below level of seventh dorsal ray. Anterior rays of soft dorsal elevated; anal quite lower, both having high scaly sheaths. Caudal with equal lobes.

Alcoholic specimens brownish drab dorsally, silvery below.

Here described from a single specimen, No. 31939, 254 mm, collected from Landiok, Zamboanga Province, Mindanao, August 2, 1932.

CARANX (CARANGOIDES) GYMNOTETHOIDES Bleeker. Plate 5, fig. 1.

Carangoides gymnotethoides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 364; Verh. Bat. Gen. 24 (1852) 28, 61; JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 199; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 40;

- FOWLER, Mem. B. P. Bishop Mus. 10 (1928) 150; Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 92.
- Caranx gymnostethoides* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 431; KNER, Zool. Fische 1-3 (1865-1867) 153; DAY, Fishes of India. Text 1 (1878-1888) 217; Fauna of British India. Fishes 2 (1889) 155; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; PELLEGRIN, Bull. Soc. Zool. France 39 (1914) 228; McCULLOCH, Rec. Aust. Mus. 15 (1926-1927) 31; Mem. Aust. Mus. pt. 2 5 (1929-1930) 187.
- Carangoides gymnostethoides evermanni* NICHOLS, Am. Mus. Novit. no. 50 (1922) 3.
- Ferdauia evermanni* JORDAN, EVERMANN, and TANAKA, Proc. Cal. Acad. Sci. 16 (1927-1928) 662.
- Caranx (Carangoides) gymnostethoides* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 231.

Head 3.2; depth 3.2; dorsals VII, I, 30 (preceded by one procumbent spine); pectoral I, 19; anal II, I, 25; lateral line straightening below twenty-fourth ray of soft dorsal, with 23 scutes posteriorly.

Body elliptical, compressed, dorsal contour more convex than ventral profile. Mouth terminal, its cleft opposite level of preopercle. Maxillary terminates below anterior border of eye. Lower jaw slightly lower than upper.

Teeth in villiform bands in jaws, vomer, palatines, and tongue. Snout obtuse, 2.5 in head. Preorbital length 1.3 in snout. Eye 4.9 in head, situated along horizontal axis of body, mostly on anterior half of head. Adipose eyelid poorly developed. Interorbital space somewhat convex, crossed by a fronto-occipital keel. Infraorbital, postorbital, upper opercular, and nuchal region scaled. Opercular opening wide, extending anteriorly below anterior margin of eye. Gillrakers 20. Breast without scales; naked triangular area extending beyond base of ventrals posteriorly, dorsally reaching base of pectoral.

Spinous dorsal base 6.8 in standard length. Spines weak, depressible in a groove; third spine longest. Origin of soft dorsal nearer caudal base than tip of snout. Pectoral falcate, longer than head. Ventral short, 2.8 in head, inserted below base of second spine of spinous dorsal. Anal base shorter than that of soft dorsal, its origin below ninth ray of latter. Anterior rays of soft dorsal and anal not elevated into falcate lobe. Last ray of soft dorsal and anal finletlike and longer than preceding ray. Caudal widely forked. Alcoholic specimens generally brownish, the breast whitish.

Here described from a single specimen, No. 13979, 459 mm long, collected from Jolo, Sulu, May 25, 1926.

CARANX (CARANGOIDES) ARMATUS (Forskål). Buensang-sapse. Plate 5, fig. 2.

Sciæna armata FORSKÅL, Descriptiones Animalium. Pisces (1775) 53.

Scomber armatus BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 38.

Citula plumbea QUOY and GAIMARD, Voyage autour du monde. Paris (1824) 361.

Citula ciliaria RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 102.

Citula armata RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 103; BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 242; 4 (1873) 131; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 83; JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 443; OSHIMA, Philip. Journ. Sci. 26 (1925) 396.

Caranx citula CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 94; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 346; KNER, Zool. Fische 1-3 (1865-1867) 156.

Caranx armatus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 95; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1113; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 453; DAY, Proc. Zool. Soc. London (1865) 25; Fishes of Malabar (1865) 89; Fishes of India. Text 1 (1878-1888) 223; Fauna of British India. Fishes 2 (1889) 165; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 61; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 455; Sitzgsber. Akad. Wien 80 (1880) 377; MACLEAY, Descr. Cat. Aust. Fish. Sydney 1 (1881) 171; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 24; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 511; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; 26 [1906 (1907)] 14; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; BAMBER, Journ. Linn. Soc. London 31 (1907-1915) 480; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 600; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 394; FOWLER, Proc. Acad. Nat. Sci. Phila. 77 (1925) 217; BARNARD, Ann. South African Mus. 21 (1927) 542; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 83; MCCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 189; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77.

Carangoides citula BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 2 (1851) 210, 213, 475; 3 (1852) 745; 8 (1855) 393, 398; 16 (1858-1859) 407; Verh. Bat. Gen. 24 (1852) 29, 65; 25 (1853) 14, 44.

Carangoides armatus BLEEKER, Versl. Akad. Amsterdam 12 (1861) 53, 74; FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 272; Mem. B. P. Bishop Mus. 10 (1928) 151; Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 279.

Citula ciliaris BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 235; 4 (1873) 132; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 34.

Caranx plumbeus JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 233; 26 [1906 (1907)] 14.

- Caranx rastrosus* JORDAN and SNYDER, Mem. Carnegie Mus. (2) 4 (1908) 37.
- Citula armatus* SEALE, Philip. Journ. Sci. § D 5 (1910) 272; HERRE, Pan-Pacific Res. Inst. (4) 8 (1933) 3; Notes on fishes in the Zoological Museum of Stanford University (1934) 34.
- Caranx (Citula) armatus* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 169.
- Caranx (Citula) plumbeus* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 171.
- Caranx (Citula) ciliaris* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 172.
- Citula rastrosus* OSHIMA, Philip. Journ. Sci. 26 (1925) 393.
- Caranx (Carangoides) armatus* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 233.
- Citula plumbea* HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Head 3.2; depth 1.8; dorsals VIII, I, 20 (with one procumbent spine); pectoral I, 20; anal II, I, 16; lateral line moderately arched anteriorly; 20 scutes posteriorly.

Body ovate, strongly compressed. Dorsal and ventral profiles equally convex. Head large, higher than long, its rostrum-occipital outline convex, with a slight concavity in front of nostrils. Mouth oblique. Maxillary broad posteriorly, terminating below center of eye. Jaws almost equal. Teeth in narrow villiform bands, in jaws, vomer, palatines, and tongue. Snout blunt, 3 in head. Posterior pair of nostrils larger than anterior. Eye equal to snout, 3 in head, situated in anterior half of head, crossed by longitudinal axis of body. Adipose eyelid poorly developed. Interorbital somewhat angular, 5.7 in body depth. Postorbital and anterosuperior angle of opercle with scales. Opercular opening wide, extending anteriorly below level of nostrils. Gillrakers 16, short and slender, first knoblike. Breast with a naked triangular patch which extends behind base of ventrals.

Spinous dorsal with a base 6.8 in standard length. Spines weak, third spine longest. Soft dorsal inserted midway between caudal peduncle and middle of eye. Pectorals falcate, longer than head. Ventrals short, almost equal to spinous dorsal base. Anal originating below sixth dorsal ray. Anterior rays of soft dorsal and anal filiform; seven middle rays of soft dorsal and anal filamentous in male specimen. Caudal widely forked.

Alcoholic specimens cinnamon-brown above, silvery below; fins buck-thorn brown; pectoral base black medially; opercular spot narrow.

Above description based on No. 41127, 249 mm, collected from West Coast of Guimaras Island, November 18, 1933.

LUZON, Manila Bay, No. 31548, 122 mm, December 21, 1934.

CARANX (CARANGOIDES) OBLONGUS Cuvier and Valenciennes. Plate 5, fig. 3.

Caranx oblongus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 96; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1114; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 452; DAY, Proc. Zool. Soc. London (1870) 689; Fishes of India. Text 1 (1878-1888) 222; Fauna of British India. Fishes 2 (1889) 163; PETERS, Monats. Akad. Berlin [1875 (1876)] 836; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 600; McCULLOCH, Rec. Aust. Mus. 15 (1926-1927) 31; Mem. Aust. Mus. pt. 2 5 (1929-1930) 189.

Carangoides oblongus BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; Verh. Bat. Gen. 24 (1852) 28, 62; Versl. Akad. Amsterdam 12 (1861) 53, 74; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 83; Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 79 (1927) 272; Mem. B. P. Bishop Mus. 10 (1928) 151.

Citula gracilis OGILBY, Mem. Queens. Mus. 3 (1915) 75.

Caranx (Citula) oblongus WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 175.

Caranx (Carangoides) oblongus WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 235.

Head 3.3; depth 2.1; dorsals VIII, I, 22 (with one procumbent spine); pectoral I, 21; anal II, I, 18; lateral line anteriorly arched, straightening below seventh ray of soft dorsal; 36 scutes posteriorly.

Body oblong, compressed, dorsal profile convex from snout to caudal peduncle, ventral profile oblique from chin to anal, then ascending posteriorly to beyond last ray of anal. Head large, its rostro-occipital outline convex. Mouth oblique, cleft below level of eye. Maxillary broad posteriorly, terminating below anterior half of eye. Jaws almost equal. Teeth in villiform bands in jaws, broadest anteriorly, some of outer series enlarged and conical; small patch of teeth on vomer, in a band on palatines and tongue. Snout blunt, slightly greater than eye diameter. Preorbital length equal to snout. Eye 3.7 in head, situated mostly on anterior half of head close to frontal profile. Interorbital space slightly less than eye diameter. Cheeks, temporal region, and upper portion of operculum scaly. Opercular opening wide, extending anteriorly below level of anterior border of eye. Gillrakers 19, the first four much shorter than the succeeding gillrakers. Scales wanting on breast, naked area extending beyond base of ventrals.

Spinous dorsal with a base 6 in body length. Spines slender, depressible in a groove, third spine longest. Soft dorsal origin closer to caudal base than to tip of snout. Pectoral broadly falciform, longer than head. Ventrals short, 3 in head. Anal inserted below level of sixth ray of soft dorsal. Anterior rays of soft dorsal and anal forming falcate lobes, second anterior ray of the former produced into a long filament, extending a little beyond caudal base posteriorly. Caudal widely forked, upper lobe slightly longer.

Alcoholic specimens deep brownish drab dorsally, olive-buff ventrally. Opercular spot obliterated.

Here described from specimen No. 2870, 150 mm in length, collected from Zamboanga, Mindanao, April 9, 1938.

CARANX (CARANGOIDES) CHRYSOPHRYS Cuvier and Valenciennes. Plate 6, fig. 1.

Caranx chrysophrys CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 58; KNER, Zool. Fische 1-3 (1865-1867) 155; BOULENGER, Proc. Zool. Soc. London (1887) 661; SAUVAGE, Hist. Phys. Nat. Madagascar 16 (1891) 328; PELLEGRIN, Bull. Soc. Zool. France 39 (1914) 228; BARNARD, Ann. South African Mus. 21 (1927) 540; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 186.

Carangoides chrysophryoides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 366; Verh. Bat. Gen. 24 (1852) 28, 63.

Caranx chrysophryoides GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 452; PERUGIA, Ann. Mus. Civ. Stor. Nat. Genova II 7 (1889) 274; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 242; FOWLER, Ann. Natal Mus. pt. 3 7 (1934) 423.

Citula chrysophrys BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 132; OGILBY, Mem. Queens. Mus. 3 (1915) 77.

Caranx nigrescens DAY, Proc. Zool. Soc. London (1867) 704; Fishes of India. Text 1 (1878-1888) 223; Fauna of British India. Fishes 2 (1889) 164.

Carangus armatus JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 338.

Caranx (Citula) chrysophrys WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 180.

Caranx (Carangoides) chrysophrys WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 239.

Head 2.9; depth 2; dorsals VIII, I, 21 (with one procumbent spine); pectoral I, 18; anal II, I, 18; lateral line arched anteriorly, quite parallel to dorsal contour of body, straightening below twelfth ray of soft dorsal, with 20 small scutes posteriorly.

Body ovate, strongly compressed; dorsal profile evenly rounded and more elevated than ventral, which is linear and moderately declivous between tip of mandible and ventral fins, feebly emarginate between ventrals and anal, thence acclivous

to caudal peduncle. Head large, fronto-occipital profile convex. Mouth oblique, its cleft below level of eye. Maxillary broad, terminating below anterior border of eye. Lower jaw slightly protruding. Teeth villiform, in broad bands in jaws, outer series slightly enlarged, head of vomer with angular band of similar teeth, its shaft smooth; teeth in narrow bands in palatines and tongue. Snout rather blunt, greater than eye diameter. Preorbital length about equal to snout. Eye 3.3 in head. Adipose eyelid poorly developed. Interorbital space equal to diameter of eye. Cheeks, temples, and upper edge of opercles scaly. Opercular opening extending anteriorly below level of front margin of eye. Gillrakers 15, on outer anterior arch, first knoblike. Breast with naked area extending posteriorly beyond base of ventrals.

Spinous dorsal base 6 in standard length, spines feeble, third spine longest. Soft dorsal origin nearer to caudal base than to tip of snout. Pectorals falcate, longer than head. Ventrals about equal to snout. Anal inserted below level of eighth ray of soft dorsal. Anterior rays of soft dorsal and anal elevated into falcate lobes. Caudal deeply forked with equal lobes.

Alcoholic specimens brownish drab dorsally, olive-buff ventrally. Opercular spot dusky, diffused.

Above description based on specimen No. 31940, 225 mm long, collected from Malanao, Zamboanga Province, Mindanao, August 2, 1932.

This species closely resembles *Caranx* (*Carangoides*) *malabaricus* in general body form, but differs from the latter in having different fin formulæ, a less elevated nape, and a smaller number of gillrakers.

MINDANAO, Zamboanga Province, Dapitan, No. 15062, 195 mm, March 14, 1927.

CARANX (CARANGOIDES) MALABARICUS (Bloch and Schneider). Plate 6, fig. 2.

Scomber malabaricus BLOCH and SCHNEIDER, Syst. Ichthyol. (1801) 31.

Caranx cæruleopinnatus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 100; Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 47.

Caranx malabaricus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 91; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1110; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 436; KNER, Zool. Fische 1-3 (1865-1867) 155; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 60; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 12 (1871) 463; DAY, Fishes of India. Text 1 (1878-1888) 221; Fauna of British India. Fishes 2 (1889) 163; MAC-

- LEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 167; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 510; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 600; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 394; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 562; FOWLER and BEAN, Proc. U. S. Nat. Mus. art. 2 62 (1923) 20; BARNARD, Ann. South African Mus. 21 (1927) 541; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 187; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77; HERRE, Lingnan Sci. Journ. (3) 11 (1932) 434; Notes on fishes in the Zoological Museum of Stanford University (1934) 35.
- Carangoides talamparah* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 2 (1851) 475; 3 (1852) 740, 745; Verh. Bat. Gen. 24 (1852) 29, 64; 25 (1853) 46.
- Carangoides malabaricus* BLEEKER, Nat. Tijdschr. Ned. Ind. 16 (1853-1859) 407; Versl. Akad. Amsterdam 12 (1861) 53, 74; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 83; 77 (1925) 216; 79 (1927) 272; Hongkong Naturalist 2 (1931) 293; OSHIMA, Philip. Journ. Sci. 26 (1925) 390.
- Citula malabaricus* BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 132.
- Carangus malabaricus* JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 337.
- Caranx (Citula) malabaricus* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 178.
- Caranx (Citula) caeruleopinnatus* WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 179.
- Caranx (Carangoides) malabaricus* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 237.
- Caranx caeruleo-pinnatus* HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Head 2.8 to 3; depth 2; dorsals VIII, I, 22 or 23 (with one procumbent spine); pectoral I, 18 or 19; anal II, I, 18 or 19; lateral line arched anteriorly, straightening below twelfth dorsal ray; 21 to 28 weak scutes posteriorly.

Body oblong, dorsal profile strongly convex, ventral profile less convex from chin to base of anal. Head short, higher than long. Rostro-occipital profile convex, with a slight concavity in front of nostrils. Mouth oblique, its cleft commencing below level of eye. Maxillary extending beyond front border of eye. Lower jaw slightly prominent. Teeth in villiform bands on jaws, vomer, palatines, and tongue. Snout blunt, slightly greater than diameter of eye. Preorbital equal to eye. Eye large, 3 in head. Adipose eyelid poorly developed. Interorbital space less than eye with fronto-occipital keel. Infraorbital and postorbital scaled. Opercular opening terminating anteriorly below level of nostrils. Gillrakers 26 on lower anterior arch.

Breast broadly naked, posterior boundary of naked area formed by a line from base of pectorals to a point far beyond base of ventrals.

Spinous dorsal with a base 6.2 in standard length. Spines moderate, third spine longest. Soft dorsal origin nearer to caudal peduncle than to tip of snout. Pectorals broad-falcate, equal to or shorter than head. Ventrals rounded, equal to eye diameter. Soft dorsal inserted below level of fifth ray of soft dorsal. Anterior rays of soft dorsal and anal elevated. Caudal broadly forked.

Alcoholic specimens brownish drab dorsally, naples yellow ventrally. Opercular spot blackish.

Here described from specimen No. 6754, 135 mm long, collected from Manila, September 15, 1910.

LEYTE, Leyte Province, Carigara, No. 7839, 194 mm, No. 7882, 174 mm, No. 7883, 191 mm, No. 7884, 192 mm, November 10, 1913.

Foreign examples: Hongkong, No. 7764, 118 mm, No. 10978, 198 mm, August, 1910.

CARANX (CARANGOIDES) DINEMA Bleeker. Plate 6, fig. 3.

Carangoides dinema BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 365; Verh. Bat. Gen. 24 (1852) 28, 63.

Leioglossus carangoides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343, 355, 367; Verh. Bat. Gen. 24 (1852) 30, 70; Versl. Akad. Amsterdam 12 (1851) 53.

Caranx bioglossus GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 432; KNER, Zool. Fische 1-3 (1865-1867) 156; BOULENGER, Proc. Zool. Soc. London (1892) 135.

Caranx dinema GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 452.

Caranx (Citula) dinema WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 178.

Caranx carangoides FOWLER, Mem. B. P. Bishop Mus. 10 (1928) 146.

Caranx (Carangoides) dinema WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 241.

Head 3.2; depth 2.1; dorsals VIII, I, 19 (with one procumbent spine); pectoral I, 20; anal II, I, 17; lateral line straightening below twelfth dorsal ray with 23 scutes posteriorly.

Body oblong, dorsal profile convex, ventral almost straight from isthmus to origin of anal, thence acclivous to caudal peduncle. Head large, its rostro-occipital contour nearly in a straight line. Mouth oblique. Maxillary broad, posteriorly terminating about below center of eye. Lower jaw slightly longer. Teeth pluriserial in jaws in young, in bands in vomer, palatines, and tongue. Posterior portion of preorbital half diameter of eye.

Snout pointed, 3.2 in head. Eye 3.6 in head length. Adipose eyelid poorly developed. Cheek and upper opercular scaled. Interorbital less than diameter of eye, with a prominent fronto-occipital ridge. Gillrakers 17. Breast inferiorly and partly on its sides naked.

Spinous dorsal base 6 in standard length, third spine longest, 3.3 in depth of body. Soft dorsal inserted midway between front margin of eye and root of caudal. Pectoral falcate, greater than body depth. Ventral short, longer than snout. Anal origin below eighth dorsal ray. Anterior rays of soft dorsal and anal produced into long filaments, anal extending beyond caudal peduncle. Caudal widely forked.

Alcoholic specimens brownish drab dorsally, forehead wood-brown, olive-buff ventrally. Fins gray except pectoral which is paler. Opercular spot dusky, almost obliterated.

This species in general shape of body closely resembles *Caranx* (*Carangoides*) *oblongus* Cuvier and Valenciennes, but differs from the latter in having fewer scutes in the lateral line.

Here described from specimen No. 14724, 250 mm long, collected from Inabañga, Bohol, December 10, 1926.

MINDORO, Mindoro Province, Naujan, Barrio Estrella, No. 31945, 280 mm, May 19, 1939.

Subgenus *CARANX* Bleeker, 1851

Caranx BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 8 (1855) 417; Verh. Bat. Gen. 24 (1852) 56.

Body oblong, compressed, occipital region elevated. Lower jaw prominent, upper jaw terminating below or beyond center of eye. Adipose eyelid slightly developed. Breast totally scaled, or ventrally naked, with a small central patch of minute scales in front of base of ventrals. Lateral line moderately or strongly arched anteriorly. Straight portion entirely armed with scutes. Teeth in upper jaw in a villiform band, with an outer series of stronger teeth; lower jaw with a single series of middle-sized teeth, two to four anterior teeth strong and canine-like. Vomer, palatines, and tongue toothed. Anterior rays of soft dorsal and anal forming a falcate lobe; none of the rays filiform.

Key to the Philippine species of subgenus Caranx.

*a*¹. Breast totally scaled.

*b*¹. Dorsals VIII, I, 20 to 22; anal II, I, 16 or 17. Straight lateral line commencing below fourth or fifth ray of soft dorsal; 30 to 33 scutes.

C. sexfasciatus.

- b**². Dorsals VIII, I, 23 or 24; anal II, I, 18 to 20. Straight lateral line starting below seventh ray of soft dorsal, armed with 30 to 34 scutes. Numerous dark spots profusely scattered on sides.

C. stellatus.

- a**². Breast ventrally and partly laterally naked, with a small median patch of minute scales before ventrals.

- b**¹. Dorsals VIII, I, 19 or 20; anal II, I, 16 or 17. Straight lateral line beginning below sixth or seventh ray of soft dorsal; 28 to 32 scutes.

C. ignobilis.

- b**². Dorsals VIII, I, 21 or 22; anal II, I, 16 to 18. Straight lateral line starting below fifth or sixth ray of soft dorsal; 33 to 37 scutes.

C. carangus.

CARANX (CARANX) SEXFASCIATUS Quoy and Gaimard. Simbad, muslo. Plate 7, fig. 1.

Caranx sexfasciatus QUOY and GAIMARD, Voyage autour du Monde. Paris (1824) 358; CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 83; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 231; 26 [1906 (1907)] 14; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 65; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 241; SEALE, Philip. Journ. Sci. § D 5 (1910) 270; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 77 (1925) 216; 79 (1927) 270; Mem. B. P. Bishop Mus. 10 (1928) 149; Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 278; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 184; HERRE, Journ. Pan-Pacif. Res. Inst. (4) 8 (1933) 3; (2) 10 (1935) 164; Notes on fishes in the Zoological Museum of Stanford University (1934) 35; Field Mus. Nat. Hist. Chicago 21 (1936) 115.

Caranx forsteri CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 81; RICHARDSON, Ann. & Mag. Nat. Hist. 11 (1843) 28; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1109; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342, 346; 2 (1851) 210, 213; 3 (1852) 741; 8 (1855) 170, 393, 398, 447; Verh. Bat. Gen. 24 (1852) 25, 57; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 52, 74; KNER, Zool. Fische 1-3 (1865-1867) 158; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 329; JORDAN and SEALE, Proc. U. S. Nat. Mus. 28 (1905) 775; Bull. U. S. Bur. Fish. 25 [1905 (1906)] 230; 26 [1906 (1907)] 13; SEALE, Occ. Pap. B. P. Bishop Mus. 4 (1906) 30; SMITH and SEALE, Proc. Biol. Soc. Washington 19 (1906) 76; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 268; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 598; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 395; OSHIMA, Philip. Journ. Sci. 26 (1925) 377; BARNARD, Ann. South African Mus. 21 (1927) 543; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 82; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 188; HERRE, Journ. Pan-Pacif. Res. Inst. (4) 8 (1933) 3, 7; (2) 10 (1935) 164.

Caranx belengerii CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 87; BLEEKER, Verh. Bat. Gen. 25 (1853) 44; PETERS, Monats. Akad. Wiss. Berlin (1855) 438.

- Caranx flavocæruleus* TEMMINCK and SCHLEGEL, Fauna Japonica 3 (1842) 110; BLEEKER, Verh. Bat. Gen. 25 (1853) 14.
- Caranx hippos* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 449; Fische der Südsee 2 (1876-1881) 131; DAY, Proc. Zool. Soc. London (1865) 23; (1870) 688; Fishes of Malabar (1865) 86; Fishes of India. Text 1 (1878-1888) 216; Fauna of British India. Fishes 2 (1889) 154; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 61; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 170; JORDAN and GILBERT, Proc. U. S. Nat. Mus. 6 [1883 (1884)] 200; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 661; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 325; ELERA, Catálogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 510; JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 920; Rept. U. S. Fish Comm. 21 [1895 (1896)] 346; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 76; 79 (1927) 270; Bull. Amer. Mus. Nat. Hist. pt. 2 70 (1936) 696; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 240; PELLEGRIN, Bull. Soc. Zool. France 39 (1914) 228; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 561; OSHIMA, Philip. Journ. Sci. 26 (1925) 374; BORODIN, Bull. Vanderbilt Mar. Mus. art. 1 1 (1928) 18; JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 273.
- Carangus hippos* GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 434; BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 131; GOODE, Bull. U. S. Fish Comm. 1 [1881 (1882)] 34.
- Caranx hippos* KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 465; Sitzgsber. Akad. Wien 80 (1880) 377; GOODE and BEAN, Proc. U. S. Nat. Mus. 5 (1882) 237.
- Caranx marginatus* JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 922; Rept. U. S. Fish Comm. 21 [1895 (1896)] 346; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 81; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 231; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 39; JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 15; HERRE, Philip. Journ. Sci. 34 (1927) 294, 303; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 74.
- Caranx flavocæruleus* JORDAN and SNYDER, Proc. U. S. Nat. Mus. 23 (1901) 353.
- Carangus sexfasciatus* JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 337.
- Carangus elacate* JORDAN and EVERMANN, Bull. U. S. Fish Comm. 22 [1902 (1904)] 177; 23 [1903 (1905)] 190.
- Carangus marginatus* JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 444; JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 191.
- Carangus rhabdotus* JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 444; JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 192.

- Caranx elacate* JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 231; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 40; FOWLER, Mem. B. P. Bishop Mus. 10 (1928) 147.
- Tricropterus forsteri* JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 442.
- Caranx rhabdotus* JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 39.
- Selar sexfasciatus* OSHIMA, Philip. Journ. Sci. 26 (1925) 382.
- Caranx* (*Caranx*) *sexfasciatus* WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch 6 (1931) 243; HARDENBERG, Treubia 15 (1936) 246.

Head 3.2; depth 2.5 to 2.9; dorsals VIII, I, 20 to 22 (with one procumbent spine); pectoral I, 19; anal II, I, 16; lateral line strongly arched, straightening below fourth or fifth dorsal ray; 30 to 33 scutes.

Body oblong, compressed, dorsal profile more convex than ventral. Head large, rostronuchal contour slightly convex. Mouth oblique, its cleft opposite pectoral base. Maxillary broad, terminating below posterior border of pupil. Lower jaw prominent. Teeth in narrow band in upper jaw with an outer series of larger teeth, in single series in lower. Teeth in triangular patch in vomer, in narrow bands in palatines and tongue. Snout rather pointed, 3.3 to 3.7 in head. Eye 4 in head. Posterior portion of adipose eyelid fairly developed, barely covering posterior margin of pupil. Interorbital convex, with a low frontonuchal keel. Cheek, postorbital, and upper anterior border of opercular scaled. Opercular opening extending to below level of front margin of eye. Gillrakers slender, anteroposteriorly flattened, 16 or 17, first gillraker rudimentary or tuberclelike.

Spinous dorsal with a base, 6 in standard length. Spines weak, third spine longest, last spine stout and quite isolated from preceding spines. Soft dorsal origin midway between middle of eye and caudal base. Pectoral falcate, longer than head, its tip reaching fifth or sixth anal ray when depressed. Ventrals short, concealing vent in young, its tips scarcely reaching anus in adult. Anal inserted below sixth dorsal ray.

Here described from specimen No. 20613, 242 mm long, collected in Lake Bato, Camarines Sur, September 22, 1924.

LUZON, Pangasinan Province, Alaminos, No. 9669, 70 mm. No. 20701, 69 mm, 1921: Rizal Province, Malabon, No. 738, 70 mm, July 18, 1907; Pasay, No. 12134, 175 mm: Batangas Province, Lake Bombon, No. 12525, 211 mm, No. 20589, 222 mm, November 8, 1925; San Nicolas, Pansipit, No. 12968, 139 mm, January 9, 1926, No. 12955, 245 mm, January 10, 1926:

Camarines Sur Province, Lake Bato, No. 11221, 222 mm, No. 20613, 242 mm, September 22, 1924; Barrio Sibubu, San Miguel Bay, No. 20711, 215 mm, January 17 to 19, 1926. MINDORO, Mindoro Province, Calapan, No. 10341, 210 mm, January 9, 1923, No. 12492, 215 mm, February, 1925; Butas River, Naujan, No. 20593, 308 mm, No. 20594, 310 mm, April 8, 1927; Naujan, No. 11509, 178 mm, No. 20755, 93 mm, 1913. BOHOL, Bohol Province, Loay, No. 20751, 142 mm, No. 20752, 102 mm, No. 15059, 116 mm, November 19, 1926. NEGROS, Oriental Negros Province, Tolong, No. 13913, 211 mm, March 1, 1926. SIKUIJOR, No. 1406, 73 mm, No. 1407, 94 mm, September 16, 1927. SAMAR, Samar Province, Catbalogan, No. 31794, 210 mm, March 3, 1932. PANAY, Iloilo Province, Estancia, No. 10438, 365 mm, June 6, 1922. MINDANAO, Agusan Province, Butuan, No. 1803, 160 mm, September 19, 1907; Davao Province, Davao, No. 3466, 110 mm, No. 3359, 96 mm, April 24 to 26, 1908; Zamboanga Province, Caldera Bay, No. 4040, 105 mm, May 20, 1908.

Foreign specimens: Hongkong, No. 10805, 150 mm, No. 20560, 135 mm, 1910; Honolulu, No. 7412, 115 mm, No. 7407, 92 mm, No. 7415, 92 mm, No. 7416, 70 mm, No. 20556, 58 mm.

CARANX (CARANX) STELLATUS Eydoux and Souleyet. Talakitok. Plate 7, fig. 2.

Caranx stellatus EYDOUX and SOULEYET, Voyage autour du monde execute pendant les annees 1836 et 1837 sur la corvette "La Bonite" commandee par M. Vaillant (1841) 167; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 436; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 40; JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 15; McCULLOCH, Rec. Aust. Mus. 15 (1926-1927) 33; Mem. Aust. Mus. pt. 2 5 (1929-1930) 187; JORDAN, EVERMANN, and TANAKA, Proc. Cal. Acad. Sci. 16 (1927-1928) 655; HERRE, Journ. Pan-Pacif. Res. Inst. (4) 8 (1933) 7; Field Mus. Nat. Hist. Chicago 21 (1936) 116; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 75; FOWLER, Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 278.

Caranx punctatus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 29; BLEEKER, Verh. Bat. Gen. 25 (1853) 44.

Caranx melampygus GÜNTHER, Fische der Südsee 2 (1876-1881) 133; DAY, Fishes of India. Text 1 (1878-1888) 214; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 230.

Carangus melampygus JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 (1903-1905) 192.

Xurel melampygus JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 272.

Xurel stellatus JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 273.

Caranx (Caranx) stellatus WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 253.

Head 3.3; depth 2.7; dorsals VIII, I, 23 (preceded by a procumbent spine); pectoral I, 20; anal II, I, 19; lateral line straightening below seventh ray of soft dorsal, with 34 scutes posteriorly.

Body somewhat short, compressed; dorsal profile elevated, in middle more or less straight to soft dorsal, thence descending to caudal peduncle; ventral profile nearly straight to anal base, ascending posteriorly. Head large, its length nearly equal to its depth; rostro-occipital outline nearly straight. Mouth terminal, its cleft opposite junction of interopercle and subopercle. Maxillary reaching middle of eye or slightly beyond. Lower jaw slightly greater than upper. Teeth in upper jaw in a narrow villiform band with an outer row of conical teeth; a single row of somewhat weak conical teeth in lower jaw; a triangular patch on vomer, in broad band in palatines, and in narrow median band in tongue. Snout blunt, 2.6 in head. Eye 6 in head length, situated above axis of body in middle of head. Interorbital space convex and trenchant, shorter than snout. Infraorbital, postorbital, upper opercular, and nuchal region scaled. Opercular opening extending anteriorly below level of anterior margin of eye. Gillrakers 17. Breast totally scaled.

Spinous dorsal base 5.9 in body length. Spines weak, third spine longest, about 4 in head. Soft dorsal base nearer caudal base than tip of snout. Anal origin inserted below third ray of soft dorsal. Anterior rays of soft dorsal and anal forming an elevated lobe, both with a scaly sheath. Pectoral falcate, longer than head. Ventrals short, inserted below pectorals. Caudal widely forked.

Alcoholic specimens olive-brown, with numerous dusky spots dorsally.

Above description based on specimen No. 13977, 500 mm, collected from Bungao, Sulu, April 9, 1926.

CARANX (CARANX) IGNOBILIS (Forskål). Maliputo. Plate 7, fig. 3.

Scomber ignobilis FOWLER, Descriptiones Animalium. Pisces (1775) 55.

Caranx sanson RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 101; Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 48; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 447; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 466; DAY, Fishes of India. Text 1 (1878-1888) 216; Fauna of British India. Fishes 2 (1889) 155.

Caranx ignobilis KLUNZINGER, Sitzgsber. Akad. Wien 80 (1880) 377; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 231; 26 [1906 (1907)] 14; JORDAN and RICHARDSON, Bull. U. S. Bur.

- Fish. 27 [1907 (1908)] 250; SEALE, Philip. Journ. Sci. § A 3 (1908) 517; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 269; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 398; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 77 (1925) 215; Mem. B. P. Bishop Mus. 10 (1928) 148; Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 221; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 39; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 193; JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 16; BARNARD, Ann. South African Mus. 21 (1927) 545; HERRE, Philip. Journ. Sci. 34 (1927) 294; Journ. Pan-Pacif. Res. Inst. (4) 8 (1933) 3, 7; Notes on fishes in the Zoological Museum of Stanford University (1934) 35; Field Mus. Nat. Hist. Chicago 21 (1936) 113; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 186; JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 273; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors. V 3 (1933) 59.
- Carangus hippoides* JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 443.
- Carangus ignobilis* JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 188.
- Selar ignobilis* OSHIMA, Philip. Journ. Sci. 26 (1925) 383.
- Caranz (Caranz) ignobilis* WEBER and DE BEAUFORT, Fish. Indo-Aust. Arch. 6 (1931) 255; HARDENBERG, Treubia 15 (1935) 135.

Head 3; depth 2.2; dorsals VIII, I, 19 (with one procumbent spine); pectoral I, 19; anal II, I, 16; lateral line moderately arched, straightening below seventh dorsal ray; 32 scutes.

Body oblong, compressed, dorsal profile strongly convexed, ventral profile almost straight from below symphysis of mandible to base of anal, thence acclivous to caudal peduncle. Head higher than long, its rostrum-occipital contour convex. Mouth oblique, its cleft far below level of eye, opposite base of pectoral. Maxillary broad posteriorly, terminating beyond middle of eye. Jaws nearly equal. Teeth villiform, upper jaw with an outer row of enlarged teeth, lower jaw with a single row of irregularly sized teeth with a pair of small canines at symphysis; villiform in vomer, palatines, and tongue. Snout obtuse, 2.9 in head. Posterior part of preorbital 1.4 in eye. Eye 3.4 to 4.1, mostly on anterior half of head, above longitudinal axis of body. Interorbital convex, greater than eye. Adipose eyelid moderately developed. Cheeks, postorbital, upper opercular, and nuchal region with minute scales. Opercular opening wide, extending in front of vertical line through nostrils and anterior border of eye. Gillrakers 16, first three knoblike and rudimentary. Breast naked ventrally with a very small patch of minute scales in front of base of ventrals.

Spinous dorsal base 5.8 in standard length, third spine longest. Soft dorsal originating midway between nostrils and caudal base. Pectorals longer than head, falcate, reaching fourth anal ray when depressed. Ventrals short, 2.2 in head. Anal inserted below fifth ray of soft dorsal. Anterior rays of soft dorsal and anal elevated, somewhat falciform. Caudal widely forked, with 22 rays.

Alcoholic specimens cinnamon-drab dorsally, silvery below. Opercular spot obscure.

Above description based on specimen No. 20754, 170 mm long, collected from Mangarin, Mindoro, 1913.

LUZON, Manila Bay, off Pasay, No. 15259, 55 mm, December, 1920; Manila, Legaspi Landing, No. 12929, 321 mm, November, 1924; Batangas Province, Taal, Lake Bombon, No. 15259, 540 mm, March 9; 1927. MINDORO, Mindoro Province, Calapan, No. 14104, 185 mm, December, 1925, No. 9426, 290 mm, January 27, 1921, No. 14831, 230 mm, January, 1921.

CARANX (CARANX) CARANGUS Bloch. Plate 8, fig. 1.

Scomber carangus BLOCH, Ichthyologie. Hist. Nat. Poiss. pt. 10 (1797) 58; BLOCH and SCHNEIDER, Systema Ichthyologiae (1801) 28; BENNETT, Narrative of a whaling voyage round the globe from 1833 to 1836. Fishes 2 (1840) 282.

Caranx carangus LACÉPÈDE, Hist. Nat. Poiss. Paris 3 (1819) 227.

Caranx carangus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 68; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 448; KNER, Zool. Fisch. 1-3 (1865-1867) 157; PETERS, Monatsb. Akad. Berlin [1875 (1876)] 914; DAY, Fishes of India. Text 1 (1878-1888) 215; Fauna of British India. Fishes 2 (1889) 153; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 325; SMITH and SEALE, Proc. Biol. Soc. Washington 19 (1906) 76; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 242; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 241; REGAN, Trans. Zool. Soc. London 20 (1914) 276; HORA, Mem. Asiat. Soc. Bengal (2) 6 (1924) 484; BERNARD, Ann. South African Mus. 21 (1927) 545.

Caranx xanthopygus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 82; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 186; JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 16.

Caranx ekala CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 88; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 8 (1855) 398; Verh. Bat. Gen. 24 (1852) 25, 59; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 52; Ned. Tijdschr. Dierk. 4 (1873) 116, 131.

Caranx (*Caranx*) *carangus* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 257

Head 4.3; depth 3.5; dorsals VIII, I, 21 or 22 (with one procumbent spine); pectorals I, 19; anal II, I, 17; lateral line

arched anteriorly, straightening below sixth dorsal ray, with 34 to 36 scutes.

Body oblong, compressed, dorsal profile convex from nape to caudal peduncle, ventral profile almost straight from isthmus to origin of anal, thence ascending obliquely to caudal peduncle. Mouth oblique, its cleft below level of eye. Maxillary broad, terminating beyond center of eye. Lower jaw slightly longer than upper. Teeth in narrow band, in upper jaw with an outer row of larger teeth; in lower jaw with a single series, intermixed with large teeth, two pairs of caniniform teeth at symphysis; vomer with triangular patch of villiform teeth, in narrow bands in palatine and tongue. Snout pointed, 3 in head. Eye 4.4 to 5.5. Adipose eyelid poorly developed. Posterior portion of preorbital less than eye diameter. Cheeks, postorbital, upper opercular scaled. Interorbital space convex, less than snout. Opercular opening wide, extending in front of level of anterior margin of eye. Gillrakers 18. Breast with elongate, narrow, ventral, naked area; circular patch of scales in front of base of ventrals present.

Spinous dorsal base 7.4 in standard length. Spines weak, fourth spine longest. Soft dorsal origin nearer base of caudal than tip of snout. Anterior rays of soft dorsal like those of anal, forming a falciform lobe. Pectorals longer than head, its tip reaching fourth ray of anal when depressed. Ventrals 2 in head, extending to middle of vent. Anal inserted below level of seventh soft dorsal ray. Preanal spines unequal, second spine stouter and longer than first. Caudal lobes acute and equal.

Alcoholic specimens generally brown. Opercular spot indistinct.

Above description based on specimen No. 13978, 582 mm, collected from Bungao, Sulu Province, Mindanao, April 9, 1926.

Subgenus *SELAROIDES* Bleeker, 1851

Selaroides BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; Verh. Bat. Gen. 24 (1852) 71, 87.

Body oblong, elongate, compressed. Head pointed. Lower jaw slightly prominent. Upper jaw, vomer, and palatines without teeth; lower jaw with a single series of minute teeth; teeth on tongue rudimentary. Breast scaled. Lateral line only very slightly arched anteriorly, becoming straight below tenth ray of soft dorsal; 23 to 30 scutes. Anterior rays of soft dorsal and anal somewhat elevated.

CARANX (SELAROIDES) LEPTOLEPIS Cuvier and Valenciennes. Salay-salay batan; Salay-salay habagat. Plate 8, fig. 2.

Caranx leptolepis CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 48; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1108; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 346; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 440; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 168; DAY, Fishes of India. Text 1 (1878-1888) 225; Fauna of British India. Fishes 2 (1889) 167; BOULENGER, Proc. Zool. Soc. London (1889) 240; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 510; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 250; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 599; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 397; FOWLER, Copeia No. 58 (1918) 63; McCULLOCH, Mem. Queens. Mus. 8 (1924-1926) 72; Mem. Aust. Mus. pt. 2 5 (1929-1930) 188.

Selaroides leptolepis BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 2 (1851) 213, 475; 3 (1852) 741, 745; Versl. Akad. Amsterdam 12 (1861) 53; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Leptaspis leptolepis BLEEKER, Verh. Bat. Gen. 24 (1852) 30, 71; OSHIMA, Philip. Journ. Sci. 26 (1925) 387.

Caranx cheverti MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 169.

Carangus leptolepis JORDAN and EVERMANN, Proc. U. S. Nat. Mus. 25 (1903) 337.

Caranx (Selaroides) leptolepis WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 208; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 262.

Gnathanodon leptolepis FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 271; Mem. B. P. Bishop Mus. 10 (1928) 150.

Head 3.4; depth 2.7; dorsals VIII, I, 24 or 25 (with one procumbent spine); pectoral I, 19; ventral I, 5; anal II, I, 21; caudal 20; lateral straightening below tenth dorsal ray, with 23 scutes posteriorly.

Body oblong-elongate, dorsal profile and ventral contour equally convex; head pointed, its length greater than its height. Mouth oblique, cleft opposite center of eye. Maxillary reaches a little beyond front border of eye. Teeth wanting in upper jaw, vomer, and palatines; lower jaw with a single series of minute teeth; more or less rudimentary in tongue. Posterior margin of preorbital less than diameter of pupil. Snout pointed, almost equal to eye. Eye moderate, 3 to 3.6 in head. Interorbital space convex, about equal to eye diameter. Adipose eyelid fairly developed, pupil partly covered posteriorly. Opercular opening wide, extending in front of level of anterior margin

of eye. Gillrakers slender and finely tuberculated, 31 on anterior arch.

Spinous dorsal base 8.5 in standard length, spines weak, third spine longest, 2.6 in depth of body. Soft dorsal origin slightly ahead of anal. Anal inserted below second dorsal ray. Dorsal and anal with scaly basal sheath. Pectorals falcate, longer than head. Ventrals short, 2.6 in head length, tip extending midway between its base and origin of anal. Caudal forked, lobes equal.

Fresh specimens Russian green above and silvery below, with a wax-yellow band running subhorizontally from upper border of eye to caudal peduncle. Basal scaly sheath of dorsal and anal with minute dusky spots. Fins hyaline. A distinct opercular spot encroaching well on shoulder.

Above description based on specimen No. 41336, 126 mm long, collected on the west coast of Guimaras Island, November 18, 1933.

LUZON, Manila, Divisoria market, No. 6752, 143 mm, June, 1910, No. 10790, 123 mm, No. 11052, 124 mm, No. 20623, 118 mm, No. 20624, 121 mm, No. 20769, 116 mm, No. 20770, 123 mm, No. 20771, 128 mm, No. 20772, 130 mm, No. 20773, 119 mm, No. 20774, 119 mm, June 12, 1924, No. 15052, 128 mm, No. 20568, 148 mm, No. 20569, 135 mm, April 7, 1927. SAMAR, Samar Province, Basey, San Pedro Bay, No. 12361, 103 mm, No. 20649, 98 mm, September 17, 1925. LEYTE, Leyte Province, Carigara, No. 15056, 156 mm, December 1, 1926. PANAY, Antique Province, No. 41122, 141 mm, December 15, 1933. CEBU, Cebu Province, Cebu, No. 12238, 100 mm, No. 20691, 99 mm, No. 20692, 105 mm, No. 20693, 107 mm, No. 20694, 106 mm, No. 20695, 95 mm, No. 20696, 98 mm, No. 20697, 105 mm, No. 20698, 103 mm, No. 20699, 97 mm, No. 20700, 94 mm, September 15, 1925. NEGROS, Occidental Negros Province, Sicaba, Cadiz Nuevo, No. 31942, 136 mm.

Subgenus GNATHANODON Bleeker, 1851

Gnathanodon BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 352; 3 (1855) 418; Verh. Bat. Gen. 24 (1852) 30, 72.

Body oblong, compressed. Head large. Eye above longitudinal axis of body, in middle of head. Lower jaw slightly shorter, upper jaw strongly protractile into a subhorizontal tube. Teeth wanting in both jaws; tongue rough, with minute denticulation. Scales small. Lateral line moderately arched anteriorly, posterior part with 15 feeble scutes. Anterior dorsal and anal rays forming elevated but not falcate lobe.

CARANX (GNATHANODON) SPECIOSUS Forskål. Talakitok. Plate 8, fig. 3.

Scomber rim, speciosus FORSKÅL, Descriptiones Animalium. Pisces (1775) 54.

Scomber speciosus BLOCH and SCHNEIDER, Systema Ichthyologiae (1801) 31.

Caranx speciosus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 96; CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 97; RICHARDSON, Ann. & Mag. Nat. Hist. 11 (1843) 28, Ichthyol. Voy. H.M.S. "Erebus" and "Terror." London (1844) 136; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1115; PETERS, Monatsb. Akad. Wiss. Berlin (1855) 438; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 444; DAY, Proc. Zool. Soc. London (1865) 25; (1870) 689; Fishes of Malabar (1865) 84; Fishes of India. Text 1 (1878-1888) 226; Fauna of British India. Fishes 2 (1889) 168; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 61; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 455; Sitzgsber. Akad. Wien 80 (1880) 377; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 169; JORDAN and GILBERT, Proc. U. S. Nat. Mus. 6 [1883 (1884)] 201; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 661; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 510; JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 447; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; SNYDER, Bull. U. S. Fish Comm. 22 [1902 (1904)] 525; JORDAN and EVERMANN, Bull. U. S. Fish. Comm. 23 [1903 (1905)] 197; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232; 26 [1906 (1907)] 14; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 64; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 241; SEALE, Philip. Journ. Sci. § D 5 (1910) 270; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 397; PELLEGRIN, Bull. Soc. Zool. France 39 (1914) 228; OGILBY, Mem. Queens. Mus. 3 (1915) 67; BARNARD, Ann. South African Mus. 21 (1927) 548; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 82; MCCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 185; BORODIN, Bull. Vanderbilt Mar. Mus. art. 2 1 (1930) 49.

Gnathanodon speciosus BLEEKER, Nat. Tijdschr. Ned. Ind. 2 (1851) 471, 475; 3 (1852) 740, 745; 8 (1855) 398; Verh. Bat. Gen. 24 (1852) 30, 72; 25 (1853) 46; Versl. Akad. Amsterdam 12 (1861) 53, 74; Ned. Tijdschr. Dierk. 1 (1863) 235; JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 928; Rept. U. S. Fish Comm. 21 [1895 (1896)] 347; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 41; OSHIMA, Philip. Journ. Sci. 26 (1925) 402; FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 271; Mem. B. P. Bishop Mus. 10 (1928) 149; Monog. No. 2 Acad. Nat. Sci. Phila. (1938) 279; JORDAN, EVERMANN, and CLARK, Rept. U. S. Comm. Fish. pt. 2 (1930) 273; HERRE, Journ. Pan-Pacific Res. Inst. (4) 3 (1933) 3; Notes on fishes in the Zoological Museum of Stanford University (1934) 35; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 77.

Caranx edentulus MACLEAY, Descr. Cat. Aust. Fish. Sydney 1 (1881) 169; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 232.

Caranx (Gnathanodon) speciosus WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 209; Fishes Indo-Aust. Arch. 6 (1931) 264.

Head 2.7 to 3.1; depth 2.2; dorsals VII, I, 18 or 19 (with one procumbent spine); pectoral I, 21; anal II, I, 16; caudal 22; lateral line posteriorly with 15 to 17 scutes.

Body oblong, dorsal contour evenly convex from snout to caudal peduncle; ventral profile almost sublinear from isthmus to origin of anal, beyond which it becomes acclivous. Head large, infra-orbital to angle of mouth, postorbital, upper opercular, occiput, and nuchal region scaled. Mouth oblique, its cleft opposite pectoral base. Maxillary broad, terminating beyond front border of eye. Upper jaw strongly protractile, slightly longer than lower. Teeth absent, tongue rough with very minute denticulation. Snout blunt, 2.7 in head. Posterior part of preorbital slightly less than eye diameter. Eye small, 3.7 to 4.7 in head, depending upon age. Adipose eyelid poorly developed. Opercular opening wide, extending anteriorly to a vertical between anterior margin of eye and nostrils. Gillrakers slender, 19 to 21.

Spinous dorsal base 7.3 in standard length. Spines weak, second spine longest; seventh spine shortest, stouter than preceding spines. Soft dorsal with a base 2.4 in standard body length, its origin a little nearer to base of caudal than to tip of snout. Pectoral falcate, shorter than head in young, equal to or longer than head in adult. Anal inserted below seventh dorsal ray. Anterior rays of soft dorsal and anal elevated but not forming a falciform lobe. Caudal widely forked, lobes equal.

Alcoholic specimens cinnamon-drab dorsally, pale olive-buff ventrally, with 8 to 11 alternating wide and narrow natal-brown crossbands which do not quite reach ventral edge of trunk; first crossband passing through eye obliquely, second crossing back and posterior part of operculum; crossbands more pronounced in young, gradually disappearing with age.

Here described from specimen No. 15118, 307 mm long, collected in Subic Bay, Zambales Province, April 9, 1927.

LUZON, Manila market, Nos. 9663, 171 mm, October 28, 1910, No. 562, 116 mm, June 15, 1907. MINDORO, Mindoro Province, Mangarin, No. 6165, 109 mm, 1913. MASBATE, No. 9957, 111 mm, No. 20585, 95 mm, June 2, 1922. PANAY, Iloilo Province,

Estancia, No. 11758, 141 mm, February 11, 1925. GUIMARAS ISLAND, west coast, No. 41152, 143 mm, November 18, 1933. NEGROS, Occidental Negros Province, Cadiz Nuevo, No. 16189, 142 mm, No. 20596, 115 mm, August, 1929: Oriental Negros Province, Dumaguete, No. 14821, 159 mm, March 5, 1922. BOHOL, Inabañga, No. 14728, 159 mm, No. 20702, 116 mm, December 3, 1926. PALAWAN, Taytay, Guinlo, No. 31387, 167 mm, No. 31943, 132 mm, No. 31944, 147 mm, November 8, 1934.

Genus ULUA Jordan and Snyder, 1908

Ulua JORDAN and SNYDER, Mem. Carnegie Mus. 4 (1908) 39.

Body oblong, compressed. Head large; mouth oblique, with sharp-edged lips. A single row of minute teeth in jaws; a patch of very fine teeth on vomer and a narrow band on each palatine. Gillrakers very numerous, exceedingly long, featherlike in shape, projecting into the mouth on each side of tongue. Breast scaleless, naked area extending posteriorly to a line between the pectoral and ventral fins.

ULUA MANDIBULARIS (Macleay). Plate 9, fig. 1.

Caranx mandibularis JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 234; FOWLER and BEAN, Proc. U. S. Nat. Mus. art. 2 62 (1923) 20.

Ulua mandibularis McCULLOCH, Mem. Aust. Mus. 8 (1924-1926) 75; pt. 2 5 (1929-1930) 190; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 83; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 266.

Carangoides mandibularis FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 272; Mem. B. P. Bishop Mus. 10 (1928) 151.

Head 2.6; depth 1.8; dorsal VII, I, 20; pectorals I, 18; anal II, I, 17; lateral line arched anteriorly, becoming straight below ninth or tenth soft dorsal ray, with 28 scutes posteriorly.

Body strongly compressed, somewhat ovate in young, oblong in adult, dorsal profile more arched than ventral. Head higher than long, frontonuchal outline convex, with a slight rostrifrontal concavity in smaller specimens, more pronounced in large specimens. Mouth oblique, large, its cleft opposite lower third of eye. Snout slightly pointed. Maxillary with acute triangular supplemental bone, terminating below center of eye. Jaws almost equal. Chin projecting anteriorly in advance of upper jaw, forming an obtuse angle. Teeth minute, in single row in jaws, a small patch on vomer. Palatines and tongue apparently edentulous. Preorbital length greater than snout. Eye 4.2 in head, equal to or greater than snout. Adipose eyelid

poorly developed in young, developing fairly with age. Interorbital space less or greater than eye diameter. Infraorbital, postorbital, and upper opercular scaled. Opercular opening extending anteriorly below level of nostrils. Gillrakers 58, extraordinarily long, on lower anterior arch. Breast without scales, posterior margin of naked area extending from base of pectorals to beyond base of ventrals.

Spinous dorsal base 6.8 in standard length. Spines weak, third spine longest. Origin of soft dorsal almost midway between tip of snout and caudal base. Anterior rays of soft dorsal forming a falcate lobe, first ray produced. Pectorals falcate, longer than head, extending to about middle of anal when depressed. Ventrals short, equal to or less than snout. Anal inserted below level of seventh ray of soft dorsal, its anterior rays forming falcate lobe; first ray filiform. Caudal forked, with equal lobes; base of each lobe with two crestlike ridges.

Alcoholic specimens grayish olive dorsally, pale orange-yellow ventrally.

Here described from specimen No. 31938, 510 mm long, collected from the Royal Fish Landing, Manila, January 20, 1937.

PANAY, Iloilo Province, Estancia, No. 20632, 275 mm, June 16, 1922.

Genus ALECTIS Rafinesque, 1815

*Alectis** RAFINESQUE, *Analyse de la Nature* (1815) 84.

Blepharis CUVIER, *Regne Animal*. ed. 1. Poissons (1817) 135.

Scyris CUVIER, *Regne Animal*. ed. 1. Poissons (1817) 135.

Gallichthys CUVIER and VALENCIENNES, *Hist. Nat. Poiss.* 9 (1833) 125.

Blepharichthys GILL, *Proc. Acad. Nat. Sci. Phila.* 14 [1862 (1863)] 431, 436.

Body elevated, strongly compressed, dorsal and ventral contours angular. Lateral line strongly curved to below middle of soft dorsal, straight portion with 8 to 15 weak scutes posteriorly. Scales minute and deeply embedded. Head large and deep. Pectoral long and falciform. Caudal deeply forked.

Key to the Philippine species of *Alectis*.

- a¹. Snout short and rounded; eye large; maxillary terminating beyond front border of eye; gillrakers 14 or 15, long and slender; vent about midway between ventrals and anal..... *Alectis ciliaris*.
- a². Snout long and pointed; eye small; maxillary not extending to front border of eye; gillrakers 23, short and stout; vent much nearer ventrals than anal..... *Alectis indica*.

*Jordan and Evermann, *Genera of Fishes* pts. 1-4 (1917-1920) 88.

ALECTIS CILIARIS (Bloch). Plate 9, fig. 2.

Zeus ciliaris BLOCH, Ichtyol. Hist. Nat. Poiss. pt. 6 (1788) 27; BLOCH and SCHNEIDER, Systema Ichthyologiae (1801) 94.

Scomber filamentosus BLOCH and SCHNEIDER, Systema Ichthyologiae (1801) 34.

Blepharis fasciatus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika (1828) 129.

Caranx ciliaris CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 97; TEMMINCK and SCHLEGEL, Fauna Japonica 3 (1842) 112; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 454; Fische der Südsee 2 (1876-1881) 135; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 62; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 454; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 172; WEBER, Semon, Zoologische Forschungreisen in Australia und dem Malayischen Archipel 5 (1895) 267; DAY, Proc. Zool. Soc. London (1865) 25; (1870) 689; Fishes of Malabar (1865) 90; Fishes of India. Text 1 (1878-1888) 224; Fauna of British India. Fishes 2 (1889) 166; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 240.

Blepharis indicus TEMMINCK and SCHLEGEL, Fauna Japonica 3 (1842) 113.

Carangoides blepharis BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 3 (1852) 741, 745; 8 (1855) 398; Verh. Bat. Gen. 24 (1852) 29, 67; 25 (1953) 15.

Alectis ciliaris JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 931; Rept. U. S. Fish Comm. 21 [1895 (1896)] 347; Proc. U. S. Nat. Mus. 25 (1903) 338; Bull. U. S. Fish Comm. 23 [1903 (1905)] 200; JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 447; SNYDER, Bull. U. S. Fish Comm. 22 [1902 (1904)] 525; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 235; 26 [1906 (1907)] 14; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 242; OGILBY, Mem. Queens. Mus. 3 (1915) 85; McCULLOCH, Aust. Zool. 2 (1921-1922) 63; Mem. Aust. Mus. pt. 2 5 (1929-1930) 191; NICHOLS, Am. Mus. Novit. No. 50 (1922) 3; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 213; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 41; OSHIMA, Philip. Journ. Sci. 26 (1925) 401; BARNARD, Ann. South African Mus. 21 (1927) 549; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 269; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 35.

Alectis temminckii WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 215.

Alectis breviventralis WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 216.

Blepharis ciliaris FOWLER, Proc. Acad. Nat. Sci. Phila. 77 (1925) 218; Mem. B. P. Bishop Mus. 10 (1928) 151; Acad. Nat. Sci. Phila. Monog. No. 2 (1938) 221, 254; HERRE, Journ. Pan-Pacific Res. Inst. (2) 10 (1935) 164; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 78.

Head 2.4 to 3; depth 1.2 to 1.4; dorsals VII, I, 19 or 20 (preceded by one procumbent spine); pectoral 19; ventral 6;

anal II, I, 16 or 17, 14 or 15 feeble scutes on posterior part of lateral line.

Body somewhat ovate, almost angular, well compressed. Dorsal contour elevated, nearly equal to ventral profile; greatest depth at level of base of soft dorsal and base of anal. Caudal peduncle 4.9 to 6 in head. Head large and deep; dorsal profile of head convex, with slight concavity resulting from a marked occipitonuchal gibbosity. Mouth terminal, oblique. Cleft of mouth below eye. Maxillary terminates beyond front border of eye. Lower jaw slightly declivous. Upper and lower jaws with villiform teeth, intermixed with somewhat larger teeth anteriorly; vomer with triangular patch of villiform teeth; tongue and palatines with similar bands of teeth. Chin slightly prominent. Snout short and rounded, 3.4 to 3.8 in head. Eyes large, 2.3 to 3.2 in head, smaller than snout. Adipose eyelid poorly developed. Interorbital space 1.2 to 1.4 in eye. Opercular opening wide, extending anteriorly to below posterior third of lower jaw. Preopercular border entire. Five branchiostegal rays, all concealed. Gillrakers 14 or 15, moderately long and slender.

Lateral line strongly curved, straightening posteriorly below the twelfth or thirteenth ray of soft dorsal. Straight portion of lateral line 1.3 to 1.6 in curved portion.

Spinous dorsal 3.2 to 3.4 in head. Spines short and strong, last two spines strongest. First seven rays of soft dorsal filiform, fifth, sixth, and seventh rays longest, extending far beyond tip of caudal. Pectoral equal to or slightly longer than head, its tip reaching base of tenth or eleventh ray of anal. Ventrals 1.4 to 2 in head, inserted in advance of pectoral, 4 outer rays filamentous. Base of anal 1 to 1.1 in base of soft dorsal. Vent midway between origin of ventrals and anal.

A narrow dark suffused spot on opercle. A dark blotch on anterior soft dorsal at base of fourth, fifth, and sixth rays.

LUZON, Manila, No. 31364, 124 mm, No. 31365, 151 mm, August 28, 1934. LEYTE, Tacloban, No. 9591, 109 mm, May 7, 1921.

ALECTIS INDICA (Rüppell). *Damisa lawin*. (Tag.). Plate 9, fig. 3.

Scyris indicus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika (1828) 128; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1116. *Gallichthys major* CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1118.

- Carangoides gallichthys* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 2 (1851) 471, 475; 8 (1855) 393, 398; Verh. Bat. Gen. 24 (1852) 29, 68; 25 (1853) 44.
- Caranx gallus* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 455; Fische der Südsee 2 (1876-1881) 135; DAY, Proc. Zool. Soc. London (1865) 25; Fishes of Malabar (1865) 91; Fishes of India. Text 1 (1878-1888) 224; Fauna of British India. Fishes 2 (1889) 166; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 62; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 454; Sitzgsber. Akad. Wien 80 (1880) 377; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 173; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 661; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 512; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 561.
- Carangoides gallus* BLEEKER, Versl. Akad. Amsterdam 12 (1861) 53, 74.
- Citula gallus* BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 242; 4 (1873) 132.
- Scyris indica* FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 86; 77 (1925) 217; Mem. B. P. Bishop Mus. 10 (1928) 151.
- Alectis major* JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 251; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 217; OSHIMA, Philip. Journ. Sci. 26 (1925) 400.
- Alectis indicus* BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 600; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 41; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 214; BARNARD, Ann. South African Mus. 21 (1927) 550; BORODIN, Bull. Vanderbilt Mar. Mus. art. 1 1 (1928) 18.
- Alectis gallus* WEBER, Die Fische der Siboga Expedition. Leiden (1913) 400; HORA, Mem. Asiat. Soc. Bengal (2) 6 (1924) 484; OSHIMA, Philip. Journ. Sci. 26 (1925) 399; HERRE, Lingnan Sci. Journ. (3) 11 (1932) 434.
- Alectis indica* OGILBY, Mem. Queens. Mus. 3 (1915) 83; McCULLOCH, Aust. Zool. 2 (1921-1922) 62; Mem. Aust. Mus. pt. 2 5 (1929-1930) 191; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 83; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 271; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 36; HARDENBERG, Treubia 15 (1936) 247.

Head 2.5 to 2.9; depth 1.2 to 1.4; dorsals VI, I, 19 or 20 (preceded by a procumbent spine); pectoral 18; ventral 6; anal II, I, 16; 8 to 12 weak scutes in straight lateral line.

Body strongly compressed, angular and rhombic. Dorsal profile elevated, greater than ventral contour; greatest depth at level of base of soft dorsal and base of anal. Caudal peduncle 4.4 to 5.3 in head. Head large and rather deep, occipital

contour gibbous, anterior profile strongly acclivous. Mouth terminal, cleft opposite point midway between supraorbital and base of ventral. Maxillary extending slightly beyond halfway along snout. Lower jaw strongly declivous. Upper jaw, vomer, palatines, and tongue with minute teeth; lower jaw with slightly larger teeth. Chin prominent. Snout long and pointed, 2 to 2.2 in head. Eyes small, 3 to 3.7 in head. Adipose eyelid almost wanting. Interorbital space 1.3 to 1.5 in eye diameter. Operculum extending anteriorly to posterior border of lower jaw. Five branchiostegal rays, all hidden. Gillrakers 23, short and stout.

Lateral line strongly arched, straightening posteriorly below tenth or eleventh soft dorsal ray. Curved portion 1 to 1.2 in straight lateral line.

Spinous dorsal 3.1 to 3.8 in head. Spines short, last two spines stouter and shorter than four preceding spines. First 7 or 8 rays of soft dorsal filamentous, first three extending beyond tip of caudal. In older specimens filaments shorter, never reaching tip of caudal. Pectoral longer than head, its tip reaching base of tenth anal ray. Ventral inserted slightly ahead of pectoral; second, third, and fourth rays filiform, its tips reaching caudal base. Filaments of ventral become shorter with age. Anal base 1.2 in that of soft dorsal. Vent much nearer base of ventral than base of anal.

Opercular spot inconspicuous or absent. Five or six broad, dark, transverse bands extending from back to middle of sides. Filiform rays of dorsal, pectoral, and anal blackish.

Here described from specimen No. 11642, 130 mm, collected from Estancia, Iloilo, February 13, 1925.

LUZON, Ilocos Norte, Bangui, No. 14316, 38 mm, August 20, 1926; Manila, Divisoria market, No. 31872, 175 mm, March 13, 1931; Manila Bay, No. 31468, 207 mm, December 21, 1924. MARINDUQUE, Marinduque Province, Balanacan, No. 12904, 450 mm, February 25, 1925. PANAY, Capiz Province, Capiz, No. 12723, 92 mm, July 20, 1925. GUIMARAS, Iloilo Province, Guimaras, No. 31857, 133 mm, December 18, 1933.

Genus *HYNNIS* Cuvier and Valenciennes, 1833

Hynn timer CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 145.

Body naked, rather elongate, angular, compressed. Lateral line strongly arched, with few scutes posteriorly. Mouth moderate, with villiform teeth on jaws, vomer, palatines, and tongue. Spinous dorsal wanting; soft dorsal and anal quite elevated in

front, without filamentous rays. Soft dorsal with a spine and 18 to 20 rays; anal with a spine and 15 or 16 rays.

HYNNIS MOMSA Herre.⁷ *Damis*.

Hynn timer momsa HERRE, Philip. Journ. Sci. 34 (1927) 235.

Dorsal I, 20; anal I, 16; about 10 scutes in lateral line, last 5 scutes much enlarged, very broad and high, last scute much smaller than the four preceding scutes.

Body naked, angular, elongate-rhomboid, roughly pentagonal, very deep and strongly compressed laterally; greatest depth at origin of dorsal, 2.37 times in length.* Head higher than long, very narrow from side to side; its depth through center of eye 3.65, its length 3.92 times in total length; eye 4.77 times in head, 2.28 times in snout which is 2.09 times in head; inter-orbital very high and narrow, its height 1.81 times eye, its thickness about 1.25 times eye; profile descending abruptly from origin of dorsal to sharp angle just beyond eye, then at an angle of about 45° to mouth; ventral profile sharply angulate at origin of anal; mouth slightly oblique, maxillary 3.1 times in head, chin full, heavy, lower jaw slightly longer than upper; sub-orbital very deep, nearly equal to snout; dorsal low, first ray highest, a tenth higher than first anal ray which is 1.86 times in head, dorsal and anal otherwise nearly identical; arch of lateral line high and very long, its diameter greater than length of straight part of fifth enlarged scute from end; depth of elongate caudal peduncle less than its breadth, about 3.66 times in its length, 7.9 times in head; the very long, narrow, falcate pectoral reaching beyond a vertical from base of tenth dorsal ray, 2.68 times in length; origin of short ventral much in advance of pectoral and beneath opercle, its length 0.95 times height of first anal ray, a little less than twice in that of head; caudal deeply and widely forked, about 3.84 times in length.

Body silvery, chin pearl-white, with a black bar on upper posterior margin of opercle and a black spot in axil of pectoral; a short distance below dorsal a dark steel-blue bar about 25 millimeters wide, extending back to top of caudal peduncle and along it to caudal fin; on upper half of body, above pectoral and posteriorly, dusky spots like thumb marks; fins without markings. Seen from above the fish is very dark steel-blue, with a metallic luster.

The above description is that of Herre.(72)

⁷ Herre's type specimen could not be located.

SCOMBEROIDINÆ

Body oblong, elongate, strongly compressed, covered with lanceolate or rhombic scales embedded in the skin. Head trenchant at top, compressed, pointed. Mouth cleft moderate or wide. Jaws subequal, premaxillary not protractile. Maxillary without supplemental bone. Teeth in jaws in villiform bands when young, in one or two series in adult. Gillrakers moderate. Lateral line slightly arched anteriorly; scutes wanting. Dorsals two, separate, a spinous dorsal with 6 to 7 spines, preceded by one procumbent spine; spines with basal membrane, flattened, overlapping, reaching or not reaching base of succeeding spine when depressed. Soft dorsal and anal not falcate. Anal almost equal to soft dorsal; posterior rays of soft dorsal and anal slightly detached, forming finlets. Pectoral short, not pointed; ventrals also short, depressible in a deep median groove on abdomen.

Genus *SCOMBEROIDES*⁸ Lacépède, 1802

*Scomberoides*⁹ LACÉPÈDE, Hist. Nat. Poiss. 3 (1802) 50.

*Orcynus*¹⁰ RAFINESQUE, Analyse de la Nature (1815) 84.

Chorinemus CUVIER and VALENCIENNES, Hist. Nat. Poiss. (1831) 270.

Thynnus GRONOW, Cat. Fish. (1854) 121.

Rhaphiolepis FOWLER, Proc. Acad. Nat. Sci. 62 (1905) 59.

Body strongly compressed, elongate, oblong or nearly ovate, dorsal and ventral contour about equally convex. Head naked, short, less than depth of body. Maxillary terminating below eye or far beyond hind border of eye. Scales small, ovate, lanceolate or needlelike. Anterior portion of lateral line angulate or curved below level of anterior spinous dorsal, straightening below last spine of spinous dorsal or first spine of soft dorsal. Scutes absent. Teeth villiform in upper jaw, followed by a row of larger teeth. Lower jaw with a pair of caniniform teeth anteriorly, followed by two rows of teeth with a groove between them. Villiform teeth in vomer, in longitudinal bands in palatines, pterygoids, and tongue. Spinous dorsal with 6 to 7 spines

⁸ "*Scomberoides* as employed by Jordan, Wakiya, Fowler, and others, and by Bleeker in some of his papers up to 1863, and in all of them subsequent to that year, dates from volume III of Lacépède's work published in 1802, in which the form of the generic and specific names fully conforms to modern nomenclatorial propriety."—Hugh M. Smith, Ichthyological Notes. Copeia No. 3 (1932) 156.

⁹ Jordan and Evermann, Genera of Fishes pts. 1-4 (1917-1920) 60.

¹⁰ Ibid., 89.

preceded by a strong spine directed forward; soft dorsal with a spine and 19 to 21 rays; anal with a spine and 17 to 19 rays preceded by two strong distant spines. In both soft dorsal and anal the posterior rays connected by a low, thin membrane, making them appear penicillate.

Key to the Philippine species of Scomberoides.

*a*¹. Scales ovate or lanceolate.

*b*¹. Snout blunt, equal to eye or slightly shorter. Maxillary extending far beyond eye. Elevated dorsal and anal rays without black blotches. Scales broadly lanceolate or ovate. Gillrakers 11.

S. lysan.

*b*². Snout pointed, equal to or greater than eye. Maxillary extending to posterior third or slightly behind hind border of eye. Scales lanceolate-pointed.

*c*¹. Body elongate, its depth greater than length of head, scales rhombic. Soft dorsal with a black blotch anteriorly. Gillrakers 17, flattened and pointed..... *S. tolo-parah.*

*c*². Body deep, nearly ovate. Scales lanceolate. Soft dorsal without dark blotch anteriorly. Gillrakers 10, tapering but rather blunt.

S. tala.

*a*². Scales needle-shaped or threadlike. Snout pointed, greater than eye. Maxillary terminating slightly beyond hind border of pupil. Gillrakers 18 (16) elongate..... *S. tol.*

SCOMBEROIDES LYSAN (Forskål). Dorado; talapia. Plate 10, fig. 1.

Scomber lysan FORSKÅL, Descriptiones Animalium. Pisces (1775) 54.

Scomber forsteri BLOCH and SCHNEIDER, Systema Ichthyologiae (1801) 26.

Scomberoides commersonien LACÉPÈDE, Hist. Nat. Poiss. (1819) 184.

Lichia lysan RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 91.

Chorinemus commersonianus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 272; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342, 345; 2 (1851) 475; 3 (1852) 740, 745; Verh. Bat. Gen. 24 (1852) 23, 44; 25 (1853) 42.

Chorinemus lysan CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 284.

Chorinemus forsteri RICHARDSON, Ann. & Mag. Nat. Hist. (1843) 24.

Chorinemus lysan CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1100; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 471; BLEEKER, Versl. Akad. Amsterdam 12 (1861) 52, 74; DAY, Proc. Zool. Soc. London (1865) 25; (1870) 689; Fishes of Malabar (1865) 92; Fishes of India. Text 1 (1878-1888) 231; Fauna of British India. Fishes 2 (1889) 175; KNER, Zool. Fische 1-3 (1865-1867) 163; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 63; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 448; Sitzgsber. Akad. Wien 80 (1880) 378; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 178; MEYER, Ann. Soc. Españ.

Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 661; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 513; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 390; PELLEGRIN, Bull. Soc. Zool. France 39 (1914) 229; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 562; HORA, Mem. Asiat. Soc. Bengal (2) 6 (1924) 484; BARNARD, Ann. South African Mus. 21 (1927) 563; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 277; HARDENBERG, Treubia 15 (1936) 247.

Chorinemus sancti petri BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 345.

Scomberoides lysan JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 229; SEALE, Philip. Journ. Sci. § D 5 (1910) 272; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 601; FOWLER, Proc. Acad. Nat. Sci. Phila. 77 (1925) 213; 79 (1927) 268; Mem. B. P. Bishop Mus. 10 (1928) 140; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 238; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 181; HERRE, Journ. Pan-Pacific Res. Inst. (4) 3 (1933) 3.

Head 4.2 to 4.9; dorsals VII (VI), I, 19 or 20 (preceded by a procumbent spine); pectoral I, 17 or 18; ventral I, 5; anal II, I, 17 or 18.

Body oblong, compressed; ventral contour slightly more angular than dorsal; greatest depth at level of base of soft dorsal and anal. Head small. Rostronuchal profile declivous in a straight line, becoming slightly concave in adult. Mouth terminal, its cleft opposite lower margin of eye, maxillary slender, terminating far beyond hind border of eye. Jaws equal, upper jaw with an outer row of large conical teeth, followed by a band of viliform teeth, lower with one pair of symphysial canines directed outward, and two rows of pointed teeth, of about the same size. Snout short and blunt, 4 to 4.4 in head. Eye small, 3.2 to 4.1 in head. Adipose eyelid poorly developed. Gillrakers 11, flattened and tapering.

Spinous dorsal 1.1 to 1.4 in head. Spines flattened, nearly overlapping, each with a groove. Pectorals short, 1.4 to 1.7 in head. Ventrals inserted below pectorals, 1.6 in head without snout. Base of soft dorsal almost equal to that of anal.

Six to eight dark oval spots above lateral line, the first two touching it.

LUZON, Rizal Province, Navotas, No. 15189, 235 mm, No. 20716, 183 mm, No. 20715, 164 mm, April 11, 1927: Manila market, No. 95, 291 mm, June 1, 1907, No. 282, 191 mm, June 14, 1907. MINDORO, Mindoro Province, Mangarin, No. 10444, 171 mm, 1913. LEYTE, Leyte Province, Tacloban, No. 14772, 222 mm.

Foreign examples: Borneo, Sandakan, No. 2484, February, 1908, No. 14184, 218 mm, November 25, 1925, No. 2501, 246 mm, No. 2459, 168 mm, February, 1908; China, Hainan, Haihow, No. 10090, 162 mm, 1922.

SCOMBEROIDES TOLOO-PARAH (Rüppell). Cassisung. Plate 10, fig. 2.

Lichia toloo-parah RÜPPELL, Atlas zu der Reise im Nördlichen Afrika. Zoologie 2 (1828) 91.

Chorinemus mauritanicus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 281.

Chorinemus tolooparah RÜPPELL, Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 44; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 278; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 77; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors. V 3 (1933) 60.

Chorinemus sancti-petri BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342; 2 (1851) 212; 3 (1852) 741, 745; 16 (1858-1859) 407; Verh. Bat. Gen. 24 (1852) 24, 45; 25 (1853) 44; Versl. Akad. Amsterdam 12 (1861) 52; PETERS, Monats. Akad. Wiss. Berlin (1855) 437; GÜNTHER, Cat. Fish. British Mus. 2 (1860) 473; Fische der Südsee 2 (1876-1881) 138; KLUNZINGER, Sitzgsber. Akad. Wien 80 (1880) 378; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 331.

Scomberoides sancti petri BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 235; 2 (1865) 31.

Chorinemus toloo KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 447.

Scomberoides tolooparah JORDAN and EVERMANN, Bull. U. S. Fish Comm. 23 [1903 (1905)] 180; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 229; 26 [1906 (1907)] 13; SMITH and SEALE, Proc. Biol. Soc. Washington 19 (1906) 76; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 62; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 241; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 249; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 267; FOWLER, Copeia No. 58 (1918) 63; Proc. Acad. Nat. Sci. Phila. 79 (1927) 268; Mem. B. P. Bishop Mus. 10 (1928) 140; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 37; JORDAN, Proc. U. S. Nat. Mus. art. 33 66 (1925) 18; BORODIN, Bull. Vanderbilt Mar. Mus. art. 2 1 (1930) 49; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 3, 12; Notes on fishes in the Zoological Museum of Stanford University (1934) 36; Field Museum Nat. Hist. Chicago 21 (1936) 110.

Chorinemus moadetta WEBER, Die Fische der Siboga Expedition. Leiden (1913) 390.

Scomberoides moadetta WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 235.

Head 4.3 to 4.6; depth 3.3 to 3.4; dorsals VII, I, 20 (preceded by one procumbent spine); pectorals 17 or 18; ventral 5; anal II, I, 18.

Body oblong elongate, compressed; dorsal and ventral profile almost equal; greatest depth at level of base of soft dorsal and anal. Head small. Rostronuchal contour slightly concave above eyes. Mouth terminal, its cleft opposite middle of eye. Lower jaw slightly prominent: Maxillary narrow, extending to posterior third, or almost to hind margin, of eye. Teeth in upper jaw in a villiform band anteriorly, followed by two series of teeth; lower jaw with two caninelike teeth at symphysis, and two series of teeth with tips directed inward. Ovate patch in vomer, and in bands in palatines, pterygoids, and tongue. Snout obtuse, 3.5 to 4 in head. Eyes small, equal to snout, adipose eyelid poorly developed. Interorbital equal to or slightly greater than eye. Nostrils opposite upper third of eye, somewhat midway along snout, but mostly on posterior half. Opercular opening wide, extending anteriorly below level of posterior pair of nostrils. Gillrakers 17, pointed and flattened.

Spinous dorsal 1.2 to 1.4 in head. Spines flattened, fifth and sixth spine longest. Posterior rays of soft dorsal, like those of anal, connected by low, thin membrane, making rays appear finletlike. Pectorals short, 1.7 in head. Ventrals inserted below posterior extremity of pectoral base, shorter than pectorals. Base of soft dorsal equal to that of anal. Anterior rays of soft dorsal with a dark blotch. Six to eight series of dusky blotches above and below lateral line.

LUZON, Ilocos Sur Province, Bangui, No. 14380, 375 mm, August 19, 1926: La Union Province, Damortis, No. 14322, 170 mm, August 4, 1926: Manila, No. 6774, 262 mm, June, 1910: Rizal Province, Pasay, No. 13381, 200 mm, March 4, 1926: Batangas Province, Nasugbu, Papaya, No. 13264, 178 mm, January 10, 1926. LEYTE, Leyte Province, Cabalian, No. 9643, 160 mm, May 25, 1925. MINDANAO, Surigao Province, Gigaquit, No. 11175, 112 mm, No. 20604, 78 mm, June 5, 1921: Zamboanga Province, Sangali, No. 31753, 178 mm, July 28, 1932.

This species resembles *S. tol* very closely, but has no frontal concavity and its scales are rhombic, not needlelike.

SCOMBEROIDES TALA (Cuvier and Valenciennes). Plate 10, fig. 3.

Chorinemus tala CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1931) 277; BLEEKER, Verh. Bat. Gen. 25 (1853) 44; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 473; DAY, Proc. Zool. Soc. London (1865) 25; (1870) 689; Fishes of Malabar (1865) 93; Fishes of India. Text 1 (1878-1888) 231; Fauna of British India. Fishes 2 (1889) 176; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 391; HORA, Mem. Asiat. Soc. Bengal (2) 6 (1924) 484;

- WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 281; HARDENBERG, Treubia 15 (1936) 247.
- Chorinemus tolo* BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342; Verh. Bat. Gen. 24 (1852) 23, 45; 25 (1853) 44; DAY, Fishes of India. Text 1 (1878-1888) 232; Fauna of British India. Fishes 2 (1889) 176; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 179; VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova 50 (1921-1926) 563.
- Scomberoides tolo* BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 235; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 56.
- Scomberoides tala* BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 116; JENKINS, Bull. U. S. Fish Comm. 22 [1902 (1904)] 441; SMITH and SEALE, Proc. Biol. Soc. Washington 19 (1906) 76; JORDAN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 13; SEALE and BEAN, Proc. U. S. Nat. Mus. 33 (1907) 241; JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 441; FOWLER, Copeia No. 58 (1918) 63; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 8; Notes on fishes in the Zoological Museum of Stanford University (1934) 36.
- Eleria philippina* JORDAN and SEALE, Proc. U. S. Nat. Mus. 28 (1905) 774.
- Eleria tala* JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 249; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 181.

Head 3.8 to 4; depth 2.9; dorsals VII, I, 20 (preceded by a procumbent spine); pectoral I, 18 or 19; ventral 5; anal II, I, 18.

Body oblong, somewhat ovate, dorsal and ventral profiles both angular; greatest depth at level of base of dorsal and anal. Head small. Rostronuchal outline somewhat concave posteriorly. Mouth terminal, its cleft opposite center of or slightly above eye. Maxillary narrow, terminating at or slightly beyond hind border of eye. Chin slightly prominent. Upper jaw with a single series of teeth, lower jaw with two series, inner series composed of longer and larger teeth set far apart, outer series consisting of smaller teeth inclined forward. An elliptical patch of villiform teeth in vomer; in bands in palatines, pterygoids, and tongue. Snout pointed, equal to or greater than eye. Eye small, 3.8 to 4 in head. Interorbital greater than snout. Opercular opening terminating anteriorly below level of nostrils. Gillrakers 10, tapering, but with quite blunt tips.

Spinous dorsal 1.2 in head. Spines barely overlapping, each depressible in a groove. Anterior rays of soft dorsal and anal elevated half height of body. Pectoral short, 1.6 in head. Ventrals inserted below anterior extremity of pectoral base. Base of soft dorsal slightly greater than that of anal. Four to eight oblong, dark blotches intersecting the lateral line.

This species is close to *Scomberoides lysan* but has a shorter maxillary and a smaller number of gillrakers.

The above description is based on No. 6767, 252 mm total length, from Manila, collected in June, 1910.

LUZON, Manila, No. 34, 186 mm, May 21, 1907, No. 184, 218 mm, June 12, 1907, No. 10788, 350 mm, June 12, 1924, No. 6767, 252 mm, No. 6770, 115 mm, No. 6772, 160 mm (June, 1910: Rizal Province, Pasay, No. 11701, 258 mm, No. 31623, 262 mm, March 4, 1926: Camarines Sur Province, Sibubu, San Miguel Bay, No. 13210, 254 mm, No. 20600, 240 mm, January 17, 1926. SAMAR, Samar Province, Calbayog, No. 14961, 275 mm, No. 20786, 306 mm, December 17, 1926. PALAWAN, Palawan Province, Balabac, No. 5109, 182 mm, August 7, 1908.

SCOMBEROIDES TOL (Cuvier and Valenciennes). Plate 11, fig. 1.

Chorinemus tol CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 283; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1101; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342; 2 (1851) 475; 16 (1858-1859) 407; Verh. Bat. Gen. 24 (1852) 23, 43; 25 (1853) 36, 44; Versl. Akad. Amsterdam 12 (1861) 52, 74; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 473; DAY, Fishes of Malabar (1865) 93; KNER, Zool. Fische 1-3 (1865-1867) 162; WEBER, Die Fische der Siboga Expedition. Leiden (1913) 390; BARNARD, Ann. South African Mus. 21 (1927) 564; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 283; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors. V 3 (1933) 60; HARDENBERG, Treubia 15 (1936) 247. *Chorinemus moadetta* RÜPPELL, Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 45; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 448.

Scomberoides tol FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 59; 79 (1927) 268; JORDAN and RICHARDSON, Bull. U. S. Bur. Fish. 27 [1907 (1908)] 249; BEAN and WEED, Proc. U. S. Nat. Mus. 42 (1912) 601; FOWLER and BEAN, Proc. U. S. Nat. Mus. art. 2 62 (1923) 19; OSHIMA, Philip. Journ. Sci. 26 (1925) 351; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 8; Notes on fishes in the Zoological Museum of Stanford University (1934) 36; Field Museum Nat. Hist. Chicago 21 (1936) 110.

Head 4.6 to 4.8; depth 4 to 4.2; dorsals VII, I, 21 (preceded by one procumbent spine); pectoral 17 or 18; ventral 5; anal II, I, 19.

Body oblong and elongate. Dorsal outline of body more convex than ventral, greatest depth at level of base of soft dorsal and anal. Rostronuchal profile concave, frontal with slight anterior concavity. Mouth terminal, its cleft opposite lower margin of pupil. Maxillary somewhat truncate, terminating at or slightly beyond hind border of pupil. Chin slightly prom-

inent. Upper jaw with bands of villiform teeth anteriorly followed by an outer row of somewhat large teeth; lower jaw with two rows of teeth of almost equal size, in oval, somewhat acuminate patch in vomer, and in longitudinal bands in palatines, pterygoids, and tongue. Snout obtuse, 3.4 to 3.6 in head. Eye small, shorter than snout, 4.1 to 4.3 in head. Interorbital wide, with a slight keel, 3.2 to 3.6 in head. Nostrils slitlike, almost of equal size, somewhat halfway along snout, but mostly on posterior half. Opercular opening wide, extending anteriorly below level of anterior border of eye. Gillrakers 18 (16), elongate.

Spinous dorsal 1.2 in head. Spines flattened, quite overlapping, except sixth spine which does not reach base of seventh when depressed. Pectorals short, 1.9 in head. Ventrals shorter than pectoral, inserted below posterior extremity of base of pectoral. Base of soft dorsal slightly shorter than that of anal. Vent about midway between base of ventral and that of anal.

Anterior portion of soft dorsal blackish. Four to eight vertical oblong blotches along lateral line, first four blotches intersecting it.

Above description based on No. 15769, taken from Balabac, Palawan, November 22, 1927. Total length, 343 millimeters.

This species closely resembles *S. toloo-parah*, but differs from it in having needlelike or threadlike scales.

LUZON, Manila, No. 6773, 254 mm, June, 1911: Camarines Sur Province, San Miguel Bay, No. 10429, 190 mm, No. 20602, 194 mm, No. 2063, 198 mm, December 27, 1919. PANAY, Iloilo Province, Iloilo, No. 10359, 259 mm, July, 1922; Estancia, No. 10850, 276 mm, July, 1922. CEBU, Cebu Province, Bantayan, No. 5580, 320 mm, No. 5587, 337 mm, April, 1909. SAMAR, Samar Province, Calbayog, No. 20785, 280 mm, No. 20787, 289 mm, December 17, 1926. BALABAC, Palawan Province, No. 5061, 301 mm, August 5, 1908, No. 5142, 261 mm, August 8, 1908, No. 15769, 343 mm, November 22, 1927.

TRACHINOTINÆ

Body oblong or elevated, breast and belly rounded, with small and adherent cycloid scales, almost wanting on head. Lateral line nearly straight or only slightly arched, without scutes. Head small, opercles entire; preoperculum in young with spines. Mouth rather small; snout obtuse, intermaxillaries protractile. No pseudobranchiæ. Gillrakers of normal shape. Teeth small

on jaws, vomer, and palatines, generally lost with age. Dorsals two, a spinous with 5 to 6 spines preceded by a subcutaneous spine; spines well developed and connected by membrane, becoming rudimentary in adult. Soft dorsal and anal of similar form, their bases nearly equal, anterior rays of each forming a falcate lobe. Pectorals short and rounded; ventrals short, caudal deeply forked, with pointed lobes. Finlets absent.

Genus *TRACHINOTUS* Lacépède, 1802

- Trachinotus*¹¹ LACÉPÈDE, Hist. Nat. Poiss. 3 (1802) 78.
*Cæsiomorus*¹² LACÉPÈDE, Hist. Nat. Poiss. 3 (1802) 92.
*Acanthinion*¹³ LACÉPÈDE, Hist. Nat. Poiss. 4 (1803) 499.
*Hipodys*¹⁴ RAFINESQUE, Caratteri Nouv. An. Sicil. (1810) 41.
*Baillonus*¹⁵ RAFINESQUE, Analyse de la Nature (1815) 85.
*Bothrolæmus*¹⁶ HOLBROOK, Ichth. South Carolina (1855) 80.
*Doliodon*¹⁷ GIRARD, Proc. Acad. Nat. Sci. Phila. 10 (1859) 168.
Trachynotus GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 480.
Campogramma REGAN, Ann. & Mag. Nat. Hist. (2) 12 (1903) 350.
Pampanoa FOWLER, Proc. Acad. Nat. Sci. Phila. 58 (1906) 116.
Glaucus (Klein) FOWLER, Proc. Acad. Nat. Sci. Phila. 58 (1906) 116.
Glaucus (Klein) JORDAN and HUBBS, Ann. Carnegie Mus. 11 (1917) 463.

Characters of the genus are the same as those of the subfamily *Trachinotinæ*.

Key to the Philippine species of *Trachinotus*.

- a*¹. Height twice or less in length; cleft of mouth opposite lower level of eye; body without spots *T. blochi*.
*a*². Height more than twice in length. Cleft of mouth opposite middle or lower third of eye; body with 2 to 6 lateral round spots.... *T. bailloni*.

TRACHINOTUS BLOCHI (Lacépède). Plate 11, fig. 2.

- Scomber falcatus* FORSKÅL, Descriptiones Animalium. Pisces (1775) 57.
Cæsiomorus blochii LACÉPÈDE, Hist. Nat. Poiss. (1819) 245.
Trachinotus falcatus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika (1828) 88.
Trachinotus mookalee CUVIER and VALENCIENNES, Hist. Nat. Poiss. 3 (1831) 311; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 346; 3 (1852) 745; 8 (1855) 169, 170, 447; Verh. Bat. Gen. 24 (1852) 24, 47; 25 (1853) 44.

¹¹ Jordan and Evermann, Genera of Fishes, pts. 1-4 (1917-1929) 61.

¹² Ibid., 61.

¹³ Ibid., 64.

¹⁴ Ibid., 79.

¹⁵ Ibid., 89.

¹⁶ Ibid., 265.

¹⁷ Ibid., 291.

- Trachinotus blochii* CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 313; BLEEKER, Versl. Akad. Amsterdam 12 (1861) 52; (1861) 74.
- Trachynotus mookalee* CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1102.
- Trachynotus ovatus* GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 481; Fische der Südsee 2 (1876-1881) 139; BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 242; GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 438; DAY, Proc. Zool. Soc. London (1865) 25; (1870) 689; Fishes of India. Text 1 (1878-1888) 234; Fauna of British India. Fishes 2 (1889) 179; KNER, Zool. Fische 1-3 (1865-1867) 164; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 64; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 449; Sitzgsber. Akad. Wien 80 (1880) 378; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 180; GOODE, Bull. U. S. Fish Comm. 1 [1881 (1882)] 39; GOODE and BEAN, Proc. U. S. Nat. Mus. 5 (1882) 237; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; SAUVAGE, Hist. Phys. Nat. Pol. Madagascar 16 (1891) 332; ELERA, Catalogo Systematico de toda la Fauna de Filipinas. Vertebrados 1 Peces (1895) 514; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 187; BARNARD, Ann. South African Mus. 21 (1927) 553; BORODIN, Bull. Vanderbilt Mar. Mus. art. 3 1 (1932) 78.
- Trachynotus falcatus* LÖNNBERG, Bihang Handl. Svensk. Vet. Akad. 22 (1896) 44.
- Trachinotus ovatus* JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 235; FOWLER, Proc. Acad. Nat. Sci. Phila. 58 (1906) 116; Mem. B. P. Bishop Mus. 10 (1928) 152; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 271; OGILBY, Mem. Queens. Mus. 5 (1916) 154; McCULLOCH, Aust. Zool. 2 (1921-1922) 63; Mem. Aust. Mus. pt. 2 5 (1929-1930) 192; OSHIMA, Philip. Journ. Sci. 26 (1925) 409; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 83; WHITLEY, Rec. Aust. Mus. 16 (1927-1929) 16.
- Trachinotus blochi* WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 286; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors. V 3 (1933) 61; HERRE, Journ. Pan-Pacific Res. Inst. (4) 3 (1933) 8; Notes on fishes in the Zoological Museum of Stanford University (1934) 36.

Head 3 to 3.3; depth 1.5 to 1.7; dorsals VI, I, 18 (preceded by a strong procumbent spine); pectoral 18 or 19; ventral 5; anal II, I, 16.

Body ovate, elevated, well compressed; dorsal profile slightly greater than ventral; anterior contour slightly convex in young, straightening vertically with age; greatest depth at base of soft dorsal and anal. Head small. Rostrodorsal outline declivous. Mouth subterminal. Cleft of mouth below eye. Maxillary terminating beyond anterior third of eye. Lower and upper

jaws almost equal; teeth minute in jaws and palatines, almost wanting in vomer. Snout blunt and short, equal to or shorter than eye. Nostrils in front of eye, posterior pair a trifle larger. Eyes large, 3 to 4 in head. Adipose eyelid poorly developed. Interorbital elevated, 2.5 to 3 in head. Five branchiostegal rays. Gillrakers 8 or 9, gradually shortening anteriorly. Lateral line poorly arched, sometimes slightly undulating.

Spinous dorsal 2 to 2.3 in head. Spines strong, last three spines longest. Soft dorsal falcate, extending beyond caudal base. Pectorals short, 1.3 to 1.8 in head. Ventrals inserted slightly beyond pectorals, 2 to 2.3 in head. Anterior rays of anal produced, not extending as far as tip of soft dorsal. Base of anal almost equal to that of soft dorsal.

This species is represented in the collection by only one specimen, No. 2373, 198 mm, collected from Jolo, February, 1908.

Foreign examples: GUAM, No. 7773, 94 mm, No. 7774, 101 mm, No. 7775, 107 mm, No. 7776, 99 mm, No. 7777, 85 mm, September, 1911.

TRACHINOTUS BAILLONI Lacépède. Plate 11, fig. 3.

Cæsiomorus bailloni LACÉPÈDE, Hist. Nat. Poiss. (1819) 244.

Cæsiomorus quadripunctatus RÜPPELL, Atlas zu der Reise im Nördlichen Afrika (1828) 90.

Trachinotus bailloni CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 317; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 342, 345; 3 (1852) 741, 745; Verh. Bat. Gen. 24 (1852) 24, 46; Versl. Akad. Amsterdam 12 (1861) 74; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 66; KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool. Harvard 26 (1911) 271; OSHIMA, Philip. Journ. Sci. 26 (1925) 407; PARADICE and WHITLEY, Mem. Queens. Mus. 9 (1927-1929) 83; WHITLEY, Rec. Aust. Mus. 16 (1927-1929) 16; FOWLER, Mem. B. P. Bishop Mus. 10 (1928) 152; McCULLOCH, Mem. Aust. Mus. pt. 2 5 (1929-1930) 192.

Trachinotus quadripunctatus CUVIER and VALENCIENNES, Hist. Nat. Poiss. 8 (1831) 320.

Trachynotus quadripunctatus CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1104.

Trachynotus bailloni GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 484; BLEEKER, Ned. Tijdschr. Dierk. 1 (1863) 242; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 64; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 449; PETERS, Monats. Akad. Berlin [1875 (1876)] 440; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 180; BOULENGER, Proc. Zool. Soc. London (1887) 661; DAY, Fishes of India. Text 1 (1878-1888) 233; Fauna of British India. Fishes 2 (1889) 178.

Trachynotus bailloni DAY, Proc. Zool. Soc. London (1865) 25; GÜNTHER, Fische der Südsee 2 (1876-1881) 139; DUNCKER, Mitt. Na-

turh. Mus. Hamburg 21 (1904) 157; WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 219.

Trachinotus bailloni JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 235; WEBER, Die Fische der Siboga Expeditie. Leiden (1913) 400; OGILBY, Mem. Queens. Mus. 5 (1916) 149; JORDAN and STARKS, Ann. Carnegie Mus. 11 (1917) 443; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 288; GILTAY, Mem. Mus. Roy. Hist. Nat. Belg. Hors. V 3 (1933) 61; HERRE, Journ. Pan-Pacific Res. Inst. (4) 8 (1933) 8; Notes on fishes in the Zoological Museum of Stanford University (1934) 36; Field Mus. Nat. Hist. Chicago 21 (1936) 117.

Head 3.3 to 4.5; depth 2.2 to 2.6; dorsals VI, I, 22 to 23 (preceded by a strong procumbent spines); pectoral 17 or 18; ventral I, 5; anal II, I, 22 to 23.

Body oblong-ovate, well compressed; ventral profile more angular than dorsal; greatest depth at base of soft dorsal and anal. Head small, its depth greater than its width. Rostro-dorsal profile slightly convex. Mouth terminal. Cleft of mouth opposite lower border of pupil. Maxillary extending to anterior border of pupil. Jaws, vomer, and palatines with villiform teeth; tongue edentulous. Snout rounded, nearly equal to eye. Nostrils opposite upper border of eye anteriorly, posterior twice as large as anterior. Eyes large, 3.2 to 3.4 in head. Adipose eyelid poorly developed. Interorbital moderately elevated, 3 to 3.3 in head. Branchiostegal rays 7, first branched. Gillrakers 14 or 15, short and slender.

Spinous dorsal 1.5 in head. Spines strong, last four longest. First four anterior rays of soft dorsal produced, extending to caudal peduncle. Pectorals short, 1.5 in head. Ventrals inserted beyond pectorals. Anterior rays of anal produced, much longer than produced rays of soft dorsal. Base of anal greater than that of soft dorsal.

Two dark spots or blotches on lateral line, first spot below gap between last spine of spinous dorsal and first spine of soft dorsal; second spot below ninth or tenth ray of soft dorsal.

MINDORO, Mindoro Province, Mangarin, No. 20612, 330 mm, No. 4503, 275 mm, 1913. PANAY, Iloilo Province, Estancia, No. 11753, 257 mm, February 13, 1925. COMIRAN, Palawan Province, No. 15629, 165 mm, No. 20607, 74 mm, No. 20608, 158 mm, No. 20609, 102 mm, No. 20610, 161 mm, November 20, 1927. JOLO, Sulu Province, No. 11297, 240 mm, September 9, 1924.

SERIOLINÆ

Body oblong, or long and slender, slightly compressed, with rounded abdomen. Head without trenchant keel. Scales small, cycloid. Lateral line without scutes, weakly arched anteriorly, on caudal peduncle with a more or less distinct cutaneous keel. Mouth terminal, its cleft small or wide. Intermaxillaries protractile. Gill membranes free from isthmus; gillrakers of moderate size, in moderate or small numbers. Preoperculum and operculum entire in adults. Teeth in villiform bands in jaws, vomer, palatines, and usually on tongue. Dorsals two; a spine with six to seven spines which are connected by a membrane and depressible in a groove in youth, becoming weak and reduced in number or becoming obsolete with age. Soft dorsal with somewhat elevated anterior rays. Anal nearly half length of soft dorsal, preceded by two weak spines, which may disappear with age. Soft dorsal and anal with or without finlets. Pectorals short, not falcate; ventral inserted behind base of pectorals, usually longer than pectorals. Caudal deeply incised.

Key to the Philippine genera of Seriolinæ.

- a*¹. Soft dorsal and anal with a single two-rayed finlet..... *Elagatis*.
*a*². Soft dorsal and anal without finlet..... *Seriola*.

Genus ELAGATIS Bennett, 1835

Elagatis BENNETT, Narrative Whaling Voy. 2 (1835) 283.

Seriolichthys BLEEKER, Nat. Tijdschr. Ned. Ind. 6 (1854) 196.

*Decaptus*¹⁸ POEY, Poissons de Cuba, Mem. de Cuba 2 (1861) 291.

Irex VALENCIENNES, C. R. Acad. Sci. Paris 54 (1862) 1204.

Body long and slender, slightly compressed. Head long and pointed. Mouth terminal, small. Intermaxillary protractile, maxillary posteriorly triangular, with an elongate supplemental bone the major portion of which slips inside the preorbital. Preoperculum and operculum entire. Gill opening wide, extending forward to below eye. Gillrakers in moderate number. Body scales somewhat large, with truncate or rounded hind margins, slightly denticulate, surrounded by smaller cycloid scales. Lanceolate cycloid scales on cheeks, postorbital, and upper opercular. Lateral line slightly curved, becoming straight above origin of anal. First dorsal with six low spines. Soft dorsal and anal long, somewhat elevated anteriorly with scaly basal sheath, both with a distant two-rayed finlet posteriorly. Preanal spines small, free, visible or covered by skin. Pec-

¹⁸ Jordan and Evermann, Genera of Fishes. pts. 1-4 (1917-1920) 309.

toral short and broad; ventral inserted behind base of pectorals, superficially depressible into a narrow shallow groove. Caudal deeply incised, its lobes acute.

ELAGATIS BIPINNULATUS (Quoy and Gaimard). "Salmon." Plate 12, fig. 1.

Seriola bipinnulata QUOY and GAIMARD, Voyage autour du monde. Paris (1824) 363.

Elagatis bipinnulatus BENNETT, Narrative of a whaling voyage round the globe from 1833 to 1836. Fishes 2 (1840) 283; MEEK and BOLLMAN, Proc. Acad. Nat. Sci. Phila. 41 (1889) 42; JORDAN and EVERMANN, Bull. U. S. Nat. Mus. 47 (1896) 906; Rept. U. S. Fish Comm. 21 [1895 (1896)] 344; Bull. U. S. Fish Comm. 23 [1903 (1905)] 185; FOWLER, Proc. Acad. Nat. Sci. Phila. 57 (1905) 65; Mem. B. P. Bishop Mus. 10 (1928) 143; Acad. Nat. Sci. Phila. Monog. No. 2 (1938) 254; JORDAN and SEALE, Bull. U. S. Bur. Fish. 25 [1905 (1906)] 229; SEALE, Occ. Pap. B. P. Bishop Mus. 4 (1906) 30; WEBER, Die Fische der Siboga Expeditie. Leiden (1913) 393; McCULLOCH, Aust. Zool. 2 (1921-1927) 63; Mem. Aust. Mus. pt. 2 5 (1929-1930) 183; JORDAN and JORDAN, Mem. Carnegie Mus. 10 (1922-1925) 37; OSHIMA, Philip. Journ. Sci. 26 (1925) 357; BARNARD, Ann. South African Mus. 21 (1927) 562; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 293; HERRE, Notes on fishes in the Zoological Museum of Stanford University (1934) 36; Journ. Pan-Pacific Res. Inst. (2) 10 (1935) 164; WALFORD, Marine game fishes of the Pacific coast from Alaska to the equator (1937) 65.

Seriolichthys bipinnulatus BLEEKER, Nat. Tijdschr. Ned. Ind. 6 (1854) 196; 8 (1855) 171, 448; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 463; Fische der Südsee 2 (1876-1881) 136; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 62; KLUNZINGER, Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 452; PETERS, Monats. Akad. Wissen. Berlin (1876) 836; MEYER, Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 25; BOULENGER, Proc. Zool. Soc. London (1887) 661; DAY, Fishes of India. Text 1 (1878-1888) 228; Fauna of British India. Fishes 2 (1889) 171; GILCHRIST and THOMPSON, Ann. South African Mus. 6 (1908) 245.

Seriolichthys lineolatus DAY, Proc. Zool. Soc. London (1867) 559.

Elagatis pinnulatus GOODE, Bull. U. S. Fish Comm. 1 [1881 (1882)] 43; GOODE and BEAN, Proc. U. S. Nat. Mus. 5 (1882) 237.

Elagatis bipinnulata WAKIYA, Ann. Carnegie Mus. 15 (1923-1924) 233.

Head 3.8; depth 4; dorsals VI, I, 24 or 25; pectoral I, 19; ventral I, 5; anal II, I, 17 or 18; 2-rayed finlets, one dorsal and one ventral; scales of lateral line, 100 to 104.

Body long and slender, slightly compressed. Dorsal and ventral contours almost equal; greatest depth at level of base of soft dorsal and midway between base of ventral and vent. Head large, rostronuchal profile moderately declivous with a

slight concavity anteriorly. Mouth terminal. Cleft of mouth opposite lower margin of pupil. Maxillary with broad triangular supplemental bone terminating below vertical line passing between nostrils and eye. Chin very slightly prominent. Jaws, vomer, and palatines with villiform teeth. Snout long and pointed, 2.8 in head. Nostrils about midway between tip of snout and middle of supraorbital. Eye small, 4 to 4.6 in head. Adipose eyelid poorly developed. Gillrakers 26 to 28, tapering and flattened.

Spinous dorsal 2.5 to 3 in head. Spines strong, depressible in a groove; second, third, and fourth spines longest. Pectoral broad and short, 1.8 to 2 in head. Ventral inserted beyond pectoral base, 2 in head. Anal spines incorporated in the muscle, first almost wanting, second partially exposed. Base of soft dorsal 1.5 to 1.7 in base of anal.

MARINDUQUE, Marinduque Province, No. 11681, 393 mm, March 11, 1925, May 25, 1908. JOLO, Sulu Province, No. 11339, 392 mm, No. 20592, 371 mm, September 10, 1924.

Genus *SERIOLA* Cuvier, 1817

Seriola CUVIER, Regne Animal. ed. 1 2 (1817) 129.

*Zonichthys*¹⁹ SWAINSON, Nat. Hist. Animals 2 (1839) 248.

Naucratopsis GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 441.

Halatractus GILL, Proc. Acad. Nat. Sci. Phila. 14 [1862 (1863)] 442.

*Lepidomegas*²⁰ THOMINOT, Bull. Soc. Philom. Paris (7) 4 (1880) 173.

Seriolina WAKIYA, Ann. Carnegie Mus. 15 [1924 (July)] 230.

Regificola WHITLEY, Aust. Zool. pt. 4 6 (1931) 316.

Oblong to long and slender, slightly compressed, abdomen usually rounded. Head conical with somewhat pointed snout. Gape of mouth usually wide. Intermaxillaries protractile; maxillary with a large supplemental bone, reaching front border or middle of eye. Gill opening wide, extending anteriorly to below mandibles. Preoperculum entire, denticulated only in young.

Scales small. Lateral line slightly curved above pectorals. Scutes absent. Caudal peduncle with a cutaneous keel. Gillrakers in moderate number,* normal in shape or transformed into rudimentary tubercles. Spinous dorsal with seven weak spines connected by membrane, preceded by a more or less obsolete spine. Soft dorsal and anal quite elevated anteriorly.

¹⁹ Jordan and Evermann, Genera of Fishes. pts. 1-4 (1917-1920) 200.

²⁰ Ibid., 406.

Anal much shorter than soft dorsal, preceded by two weak spines, which disappear with age. Finlets absent. Pectoral broad, shorter than head; ventrals longer. Caudal deeply notched.

SERIOLA NIGROFASCIATA (Rüppell). Plate 12, fig. 2.

Nomeus nigrofasciatus RÜPPEL, Atlas zu der Reise im Nördlichen Afrika, Zoologie 2 (1928) 92.

Seriola binotata CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 160; CANTOR, Journ. Roy. Asiat. Soc. Bengal 18 (1849) 1119; BLEEKER, Verh. Bat. Gen. 25 (1853) 46; Versl. Akad. Amsterdam 12 (1861) 52, 74.

Seriola rüppelli CUVIER and VALENCIENNES, Hist. Nat. Poiss. 9 (1833) 161; BLEEKER, Nat. Tijdschr. Ned. Ind. 1 (1851) 343; 3 (1852) 741, 745; Verh. Bat. Gen. 24 (1852) 30, 73.

Seriola nigrofasciata RÜPPEL, Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 52; GÜNTHER, Cat. Fish. Brit. Mus. 2 (1860) 465; PLAYFAIR and GÜNTHER, Fishes of Zanzibar. London (1866) 62; KLUNZINGER, Verh. Kaiserl. Königl. Zool. Bot. Ges. Wien 21 (1871) 450; BLEEKER, Ned. Tijdschr. Dierk. 4 (1873) 116; DAY, Fishes of India. Text 1 (1878-1888) 227; Fauna of British India. Fishes 2 (1889) 170; MACLEAY, Descr. Cat. Aust. Fishes. Sydney 1 (1881) 174; DUNCKER, Mitt. Naturh. Mus. Hamburg 21 (1904) 156; EVERMANN and SEALE, Bull. U. S. Bur. Fish. 26 [1906 (1907)] 63; FOWLER, Proc. Acad. Nat. Sci. Phila. 79 (1927) 268; Mem. B. P. Bishop Mus. 10 (1928) 142; Ann. Natal Mus. pt. 3 7 (1934) 419; WEBER and DE BEAUFORT, Fishes Indo-Aust. Arch. 6 (1931) 295.

Seriola intermedia TEMMINCK and SCHLEGEL, Fauna Japonica 3 (1842) 115; BLEEKER, Verh. Bot. Gen. 25 (1853) 15.

Zonichthys nigrofasciata BARNARD, Ann. South African Mus. 21 (1927) 557.

Head 3.2 to 3.5; depth 3 to 3.5; dorsals VII, I, 31 or 32 (preceded by a procumbent spine); pectoral I, 17 to 19; ventral I, 5; anal I, I, 15 or 16.

Body oblong, slightly compressed; dorsal profile more convex than ventral; greatest depth at base of soft dorsal and anterior portion of abdomen, behind attachment of last rays of ventral. Head large. Rostrrodorsal outline convex, with a slightly prominent rostronuchal keel in young, disappearing with age. Mouth terminal, its cleft opposite lower border of eye. Maxillary narrow, extending to below middle of eye. Chin slightly protruding. Jaws, vomer, and palatines with villiform teeth. Tongue with a median narrow patch of minute teeth. Snout somewhat blunt anteriorly. Nostrils slitlike, opposite eye, about midway along snout; posterior pair larger. Eye large, 3.1 to 3.7 in head. Adipose eyelid poorly developed. Interorbital greater than eye.

2.7 to 2.9 in head. Gill opening large, extending to below anterior border of eye. Gillrakers 3 to 9, rudimentary or knoblike.

Spinous dorsal 3 to 3.9 in head. Spines weak, third spine longest. Pectoral broad and short, 1.2 to 1.6 in ventral. Ventral inserted below pectoral base, longer than pectoral, 1.1 to 1.4 in head. Origin of anal behind middle of soft dorsal. Soft dorsal rays connected by a thick fleshy membrane. Preanal spine hidden. Base of anal 2 to 2.2 in that of soft dorsal.

About six dark transverse bands, first below nuchal, second below spinous dorsal, third, fourth, and fifth below soft dorsal, sixth in caudal peduncle.

LUZON, Manila, No. 300, 170 mm, No. 423, 145 mm, June 14 and 28, 1904, No. 6895, 320 mm, June 10, 1910, No. 15969, 124 mm, March 19, 1929, No. 31621, 168 mm, October, 1930: Camarines Sur Province, Bicol River, No. 6832, 152 mm, 1918. PANAY, Iloilo Province, Dumangas, No. 9926, 139 mm, June 2, 1922.

LITERATURE CITED

1. BAMBER, RUTH C. Reports on the marine biology of the Sudanese Red Sea, from collections made by Cyril Crossland. *Journ. Linn. Soc. London* 31 (1907-1915) 477-485.
2. BARNARD, K. H. A monograph of the marine fishes of South Africa. pt. 2. *Ann. South African Mus.* 21 (1927) 419-1065.
3. BEAN, B. A., and A. C. WEED. Notes on a collection of fishes from Java made by Owen Bryant and William Palmer in 1909, with description of a new species. *Proc. U. S. Nat. Mus.* 42 (1912) 587-611.
4. BENNETT, F. D. Narrative of a whaling voyage round the globe from 1833 to 1836. *Fishes* 2 (1840) 255-289.
5. BLEEKER, P. Over eenige nieuwe geslachten en soorten van makreelachtige vischen van den Indischen Archipel. *Nat. Tijdschr. Ned. Ind.* 1 (1851) 341-372.
6. BLEEKER, P. Nieuwe bijdrage tot de Kennis der Percöidei, Scleroparei, Scianoidei, Sparodei, Maenoidei, Chaetodontoidei en Scomberoidei van den Soenda-Molukschen Archipel. *Nat. Tijdschr. Ned. Ind.* 2 (1851) 163-179.
7. BLEEKER, P. Nieuwe bijdrage tot de kennis der ichtyologische fauna van Celebes. *Nat. Tijdschr. Ned. Ind.* 2 (1851) 209-224.
8. BLEEKER, P. Bijdrage tot de kennis der ichtyologische fauna van Riouw. *Nat. Tijdschr. Ned. Ind.* 2 (1851) 469-497.
9. BLEEKER, P. Bijdrage tot de kennis der makreelachtige vischen van den Soenda-Molukschen Archipel. *Verh. Bat. Gen.* 24 (1852) 1-93.
10. BLEEKER, P. Derde bijdrage tot de kennis der ichtyologische fauna van Celebes. *Nat. Tijdschr. Ned. Ind.* 3 (1852) 739-782.
11. BLEEKER, P. Nalezingen op de ichtyologie van Japan. *Verh. Bat. Gen.* 25 (1853) 1-56.
12. BLEEKER, P. Nalezingen op de ichtyologische fauna van Bengalen en Hindustan. *Verh. Bat. Gen.* 25 (1853) 1-166.

13. BLEEKER, P. Onzieme notice sur la fauna ichthyologique de l'île de Ternate. *Ned. Tijdschr. Dierk.* 1 (1863) 228-238.
14. BLEEKER, P. Deuxieme notice sur la fauna ichthyologique de l'île D'obi. *Ned. Tijdschr. Dierk.* 1 (1863) 239-245.
15. BLEEKER, P. Species piscium bataviensium novae vel minus cognitae. *Nat. Tijdschr. Ned. Ind.* 6 (1854) 191-202.
16. BLEEKER, P. Derde bijdrage tot de kennis der ichtyologische fauna van de Kokos-Eilanden. *Nat. Tijdschr. Ned. Ind.* 8 (1855) 169-180.
17. BLEEKER, P. Zesde bijdrage tot de kennis der ichthyologische fauna van Amboina. *Nat. Tijdschr. Ned. Ind.* 8 (1855) 391-434.
18. BLEEKER, P. Vierde bijdrage tot de kennis der ichthyologische fauna van de Kokos-Eilanden. *Nat. Tijdschr. Ned. Ind.* 8 (1855) 445-460.
19. BLEEKER, P. Vischsoorten gevangen bij Japara verzameld door S. A. Thurkow. *Nat. Tijdschr. Ned. Ind.* 16 (1858-1859) 406-409.
20. BLEEKER, P. Mededeeling omtrent Vischsoorten nieuw voor de kennis der fauna van Singapoera. *Versl. Akad. Amsterdam* 12 (1861) 28-63.
21. BLEEKER, P. Iets over die vischfauna van het iland Penang. *Versl. Akad. Amsterdam* 12 (1861) 64-80.
22. BLEEKER, P. Memoire sur le poissons de la côte de Guinée. *Nat. Verh. Holl. Maatsch.* (2) 18 (1863) 1-136.
23. BLEEKER, P. Notice sur quelques poissons de la Baie de Manille. *Ned. Tijdschr. Dierk.* 2 (1865) 30-32.
24. BLEEKER, P. Memoire sur la faune ichthyologique de Chine. *Ned. Tijdschr. Dierk.* 4 (1873) 113-154.
25. BLOCH, M. E. *Ichthyologie, ou Histoire Naturelle des Poissons.* pt. 10 (1797) 1-121.
26. BLOCH, M. E., and J. G. SCHNEIDER. *Systema Ichthyologiae* (1801) 1-584.
27. BORODIN, N. A. Scientific results of the yacht "Ara" expedition during the years 1926-1928 while in command of William K. Vanderbilt. *Fishes. Bull. Vanderbilt Mar. Mus. art. 1* 1 (1928) 1-37.
28. BORODIN, N. A. Scientific results of the yacht "Ara" expedition during the years 1926-1928 while in command of William K. Vanderbilt. *Fishes. Bull. Vanderbilt Mar. Mus. art. 2* 1 (1930) 39-64; *art. 3* 1 (1932) 65-101; *art. 4* 1 (1934) 103-123.
29. BOULENGER, G. A. An account of the fishes obtained by Surgeon Major A. S. G. Jayakar at Muscat, East Coast of Arabia. *Proc. Zool. Soc. London* (1887) 653-667.
30. BOULENGER, G. A. Second account of fishes obtained by Surgeon Major A. S. G. Jayakar at Muscat, East Coast of Arabia. *Proc. Zool. Soc. London* (1889) 236-246.
31. BOULENGER, G. A. Third account of the fishes obtained by Surgeon Major A. S. G. Jayakar at Muscat, East Coast of Arabia. *Proc. Zool. Soc. London* (1892) 134-136.
32. CANTOR, THEODORE E. Catalogue of Malayan fishes. *Journ. Roy. Asiat. Soc. Bengal* 18 (1849) 983-1042.
33. CHEVEY, P. Poissons des Campagnes du Lanessan (1925-1929) pt. 1. *Travaux de l'Institut Oceanographique de l'Indochine.* 4° *Memoire* (1932) 1-155.

34. CHEVEY, P. Inventaire de la faune ichthyologique de l'Indochine. 19° Note. Institut Oceanographique de l'Indochine (1932) 1-31.
35. CUVIER, GEORGES. Le Regne Animal distribué d'après son Organization. Regne Animal. ed. 1. Poissons (1817) 392 pp.
36. CUVIER, G., and A. VALENCIENNES. Histoire Naturelle des Poissons 8 (1831) 1-375; 9 (1833) 1-379.
37. DAY, FRANCIS. On the fishes of Cochinchina, on the Malabar Coast of India. pt. 1. Proc. Zool. Soc. London (1865) 2-40.
38. DAY, FRANCIS. The fishes of Malabar (1865) 293 pp.
39. DAY, FRANCIS. On some new or imperfectly known fishes of Madras. Proc. Zool. Soc. London (1867) 558-565.
40. DAY, FRANCIS. On some new or imperfectly known fishes from India. Proc. Zool. Soc. London (1867) 699-707.
41. DAY, FRANCIS. On the fishes of Andaman Islands. Proc. Zool. Soc. London (1870) 677-705.
42. DAY, FRANCIS. The fishes of India. Text 1 (1878-1888) 210-234.
43. DAY, FRANCIS. The fauna of British India. Fishes 2 (1889) 1-509.
44. DUNCKER, GEORG. Die Fische der malayischen Halbinsel. Mitt. Naturh. Mus. Hamburg 21 (1904) 133-207.
45. ELERA, CASTO DE. Catalogo systematico de toda la fauna de Filipinas. Vertebrados 1. Peces (1895) 454-621.
46. EVERMANN, B. W., and ALVIN SEALE. Fishes of the Philippine Islands. Bull. U. S. Bur. Fish. 26 [1906 (1907)] 51-110.
47. EYDOUX, J. F. T., and F. L. A. SOULEYET. Voyage autour du monde exécuté pendant les années 1836 et 1837 sur la corvette "La Bonite" commandée par M. Vaillant. Poissons (1841) 157-216.
48. FORSKÅL, PETRUS. Descriptiones Animalium. Pisces (1775) 164 pp.
49. FOWLER, HENRY W. New, rare or little-known scombroids. II. Proc. Acad. Nat. Sci. Phila. 57 (1905) 56-88.
50. FOWLER, HENRY W. New, rare or little-known scombroids. III. Proc. Acad. Nat. Sci. Phila. 58 (1906) 114-122.
51. FOWLER, HENRY W. A list of Philippine fishes. Copeia No. 58 (1918) 62-65.
52. FOWLER, HENRY W. Fishes from Natal, Zululand and Portuguese East Africa. Proc. Acad. Nat. Sci. Phila. 77 (1925) 187-268.
53. FOWLER, HENRY W. Notes on the Philippine fishes in the collection of the Academy. Proc. Acad. Nat. Sci. Phila. 79 (1927) 255-298.
54. FOWLER, HENRY W. The fishes of Oceania. Mem. B. P. Bishop Mus. 10 (1928) 1-540.
55. FOWLER, HENRY W. Studies of Hongkong fishes. Hongkong Naturalist 2 (1931) 287-317.
56. FOWLER, HENRY W. Natal fishes obtained by Mr. H. W. Bell-Marley. Ann. Natal Mus. pt. 3 7 (1934) 403-433.
57. FOWLER, HENRY W. The marine fishes of West Africa based on the collection of the American Museum Congo Expedition, 1909-1915. Bull. Amer. Mus. Nat. Hist. pt. 2 70 (1936) 607-1369.
58. FOWLER, HENRY W. Fishes of the George Vanderbilt South Pacific Expeditions, 1937. Acad. Nat. Sci. Phila. Monog. No. 2 (1938) 349 pp.
59. FOWLER, HENRY W., and BARTON A. BEAN. Fishes from Formosa and the Philippine Islands. Proc. U. S. Nat. Mus. art. 2 62 (1923) 1-73.

60. GILCHRIST, J. D. F., and W. WARDLOW THOMPSON. Descriptions of fishes from the coast of Natal. *Ann. South African Mus.* 6 (1908) 145-206, 213-279.
61. GILL, THEODORE. Catalogue of the fishes of Lower California in the Smithsonian Institution, collected by Mr. J. Xanthus. pt. 3. *Proc. Acad. Sci. Phila.* 14 [1862 (1863)] 249-262.
62. GILL, THEODORE. Synopsis of the carangoids of the eastern coast of North America. *Proc. Acad. Nat. Sci. Phila.* 14 [1862 (1863)] 430-443.
63. GILL, THEODORE. On the family and subfamilies of Carangidae. *Proc. U. S. Mus.* 5 [1882 (1883)] 487-493.
64. GILTAY, L. Resultats scientifiques du voyage aux Indes Orientales Neerlandaises de LL.AA.RR. le Prince et la Princesse Leopold de Belgique. Poissons. *Mem. Mus. Roy. Hist. Nat. Belg. Hors. fasc.* V 3 (1933) 129 pp.
65. GOODE, BROWN G. The Carangoid fishes of the United States, pampanoes, crevalles, amber-fishes, etc. *Bull. U. S. Fish Comm.* 1 [1881 (1882)] 30-43.
66. GOODE, BROWN G., and T. H. BEAN. A list of fishes recorded as occurring in the Gulf of Mexico. *Proc. U. S. Nat. Mus.* 5 (1882) 234-240.
67. GRONOW, LORENZ THEODORE. Catalogue of fishes collected and described by Lorenz Theodore Gronow, now in the British Museum. London (1854) 1-196.
68. GÜNTHER, ALBERT. Catalogue of the fishes of the British Museum 2 (1860) 548 pp.
69. GÜNTHER, ALBERT. *Fische der Südsee* 2 (1876-1881).
70. HARDENBERG, J. D. F. Some new or rare fishes of the Indo-Australian Archipelago. IV. *Treubia* 15 (1935) 131-140.
71. HARDENBERG, J. D. F. On a collection of fishes from the estuary and the lower and middle course of the River Kapuas (W. Borneo). *Treubia* 15 (1936) 225-254.
72. HERRE, A. W. The fisheries of Lake Taal (Bombon), Luzon, and Lake Naujan, Mindoro. *Philip. Journ. Sci.* 34 (1927) 287-306.
73. HERRE, A. W. *Hynnismomsa*, a new Philippine pampano. *Philip. Journ. Sci.* 34 (1927) 235-238.
74. HERRE, A. W. Fishes from Kwangtung Province and Hainan Island, China. *Lingnan Science Journal* (3) 11 (1932) 423-443.
75. HERRE, A. W. A check-list of fishes from Sandakan, Borneo. *Journ. Pan-Pacific Res. Inst.* (4) 8 (1933) 3-5.
76. HERRE, A. W. A check-list of fishes from Dumaguete, Oriental Negros, P. I., and its immediate vicinity. *Journ. Pan-Pacific Res. Inst.* (4) 8 (1933) 6-11.
77. HERRE, A. W. A check-list of fishes known from Madang, New Guinea. *Journ. Pan-Pacific Res. Inst.* (4) 8 (1933) 12.
78. HERRE, A. W. The fishes of the Herre 1931 Philippine Expedition with descriptions of 17 new species. Notes on fishes in the Zoological Museum of Stanford University (1934) 3-106.
79. HERRE, A. W. A check-list of the fishes of the Pelew Islands. *Journ. Pan-Pacific Res. Inst.* (2) 10 (1935) 163-166.

80. HERRE, A. W. Fishes of Crane Pacific Expedition. *Field Museum Nat. Hist. Chicago* 21 (1936) 3-472.
81. HORA, SUNDER LAL. Zoological results of a tour in the Far East. *Mem. Asiat. Soc. Bengal* (2) 6 (1924) 479-501.
82. JENKINS, OLIVER P. Report on collections of fishes made in the Hawaiian Islands, with descriptions of new species. *Bull. U. S. Fish Comm.* 22 [1902 (1904)] 417-511.
83. JORDAN, D. S., and B. W. EVERMANN. The fishes of North and Middle America. pt. 1. *Bull. U. S. Nat. Mus.* 47 (1896) 1-1240.
84. JORDAN, D. S., and B. W. EVERMANN. A check-list of the fishes and fish-like vertebrates of North and Middle America. *Rept. U. S. Fish Comm.* 21 [1895 (1896)] 207-584.
85. JORDAN, D. S., and B. W. EVERMANN. Notes on a collection of fishes from the island of Formosa. *Proc. U. S. Nat. Mus.* 25 (1903) 315-363.
86. JORDAN, D. S., and B. W. EVERMANN. Descriptions of new genera and species of fishes from the Hawaiian Islands. *Bull. U. S. Fish Comm.* 22 [1902 (1904)] 161-208.
87. JORDAN, D. S., and B. W. EVERMANN. The aquatic resources of the Hawaiian Islands. I. The shore fishes of the Hawaiian Islands, with a general account of the fish fauna. *Bull. U. S. Fish Comm.* 23 [1903 (1905)] 1-574.
88. JORDAN, D. S., and ALVIN SEALE. List of fishes collected by Dr. Bashford Dean on the island of Negros, Philippines. *Proc. U. S. Nat. Mus.* 28 (1905) 769-803.
89. JORDAN, D. S., and ALVIN SEALE. The fishes of Samoa. *Bull. U. S. Bur. Fish.* 25 [1905 (1906)] 175-455.
90. JORDAN, D. S., and ALVIN SEALE. List of fishes collected at Hongkong by Capt. William Finch, with description of five new species. *Proc. Davenport Acad. Sci.* 10 (1907) 1-17.
91. JORDAN, D. S., and ALVIN SEALE. Fishes of the islands of Luzon and Panay. *Bull. U. S. Bur. Fish.* 26 [1906 (1907)] 1-48.
92. JORDAN, D. S., and C. H. GILBERT. A review of the American Caranginae. *Proc. U. S. Nat. Mus.* 6 [1883 (1884)] 188-207.
93. JORDAN, D. S., and C. L. HUBBS. Notes on a collection of fishes from Port Said, Egypt. *Ann. Carnegie Mus.* 11 (1917) 461-468.
94. JORDAN, D. S., and E. C. STARKS. Notes on a collection of fishes from Ceylon, with description of new species. *Ann. Carnegie Mus.* 11 (1917) 430-460.
95. JORDAN, D. S., and E. K. JORDAN. A list of the fishes of Hawaii, with notes and descriptions of new species. *Mem. Carnegie Mus.* 10 (1922-1925) 1-92.
96. JORDAN, D. S., and JOHN OTTERHEIN SNYDER. A list of fishes collected in Japan by Kainosuke Otaki, and by the United States Fish Commission steamer "Albatross" with descriptions of fourteen new species. *Proc. U. S. Nat. Mus.* 23 (1901) 335-380.
97. JORDAN, D. S., and JOHN OTTERHEIN SNYDER. Description of three new species of carangoid fishes from Formosa. *Mem. Carnegie Mus.* 4 (1908) 37-40.

98. JORDAN, D. S., and R. E. RICHARDSON. Fishes from islands of the Philippine Archipelago. Bull. U. S. Bur. Fish. 27 [1907 (1908)] 233-287.
99. JORDAN, D. S., B. W. EVERMANN, and H. W. CLARK. Check-list of the fishes and fish-like vertebrates of North and Middle America, north of the northern boundary of Venezuela and Colombia. Rept. U. S. Comm. Fish. pt. 2 (1930) 1-670.
100. JORDAN, D. S., B. W. EVERMANN, and S. TANAKA. Notes on new or rare fishes from Hawaii. Proc. Cal. Acad. Sci. 16 (1927-1928) 649-680.
101. JORDAN, ERIC KNIGHT. Notes on the fishes of Hawaii with descriptions of six new species. Proc. U. S. Nat. Mus. art. 33 66 (1925) 1-43.
102. KENDALL, W. C., and E. L. GOLDSBOROUGH. The shore fishes (in scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, by U. S. Fish Commission steamer "Albatross", from August, 1899, to March, 1900). Mem. Mus. Comp. Zool. Harvard 26 (1911) 239-343.
103. KLUNZINGER, C. B. Synopsis der Fische des Rothen Meeres. pt. 2. Verh. Kaiserl. Königl. Zool.-Bot. Ges. Wien 21 (1871) 441-688.
104. KLUNZINGER, C. B. Die von Müllersche Sammlung australischer Fische in Stuttgart. Sitzgsber. Akad. Wien 80 (1880) 325-430.
105. KNER, RUDOLF. Reise der österreichischen Fregatte "Novara" um die Erde in den Jahren 1857-1859, unter den Befehlen des Commodore R. von Wullerstorf-Urbain. Zool. Fische 1-3 (1865-1867) 433 pp.
106. LACÉPÈDE, B. G. Histoire naturelle des poissons. Paris 3 (1819) 1-527.
107. LINNÆUS, C. Systema naturae. Paris ed. 10 1 (1758) 823 pp.
108. LÖNNBERG, A. J./E. Linnéan type-specimens of birds, reptiles, batrachians and fishes in the zoological museum of the Royal University in Upsalå. Bihang Handl. Svensk. Vet. Akad. 22 (1896) 1-45.
109. MACLEAY, WILLIAM. Descriptive catalogue of Australian fishes. Sydney 1 (1881) 1-264.
110. MCCULLOCH, ALLAN R. Check-list of the fish and fish-like animals of New South Wales. Aust. Zool. 2 (1921-1922) 24-68.
111. MCCULLOCH, ALLAN R. Ichthyological Items. No. 2. Mem. Queens. Mus. 8 (1924-1926) 61-76.
112. MCCULLOCH, ALLAN R. Studies in Australian fishes. Rec. Aust. Mus. 15 (1926-1927) 28-39.
113. MCCULLOCH, ALLAN R. A check-list of the fishes recorded from Australia. Mem. Aust. Mus. pt. 2 5 (1929-1930) 145-329.
114. MEEK, S. E., and C. H. BOLLMAN. Notes on *Elagatis bipinnulatus*. Proc. Acad. Nat. Sci. Phila. 41 (1889) 42-44.
115. MEEK, S. E., and D. K. GOSS. A review of the American species of the genus *Trachynotus*. Proc. Acad. Nat. Sci. Phila. 36 [1884 (1885)] 121-129.
116. MEYER, A. B. Catálogo de los peces recolectados en el archipiélago de las Indias orientales durante los años 1870 á 1873. Ann. Soc. Españ. Hist. Nat. Madrid 14 (1885) 5-49.

117. NICHOLS, JOHN TREADWELL. *Carangoides jordani* from the Hawaiian Islands, with notes on related fishes. *Am. Mus. Novit.* No. 50 (1922) 1-3.
118. NORMAN, J. R. The carangid fishes of the genus *Decapterus* Bleeker. *Ann. & Mag. Nat. Hist.* 16 (1935) 252-264.
119. OGILBY, J. DOUGLAS. Edible fishes of Queensland. pt. 3. Carangidae (No. 1). *Mem. Queens. Mus.* 3 (1915) 57-98.
120. OGILBY, J. DOUGLAS. Edible fishes of Queensland. pt. 3. Carangidae (No. 2). *Mem. Queens. Mus.* 5 (1916) 146-159.
121. OSHIMA, M. A review of the carangoid fishes in the waters of Formosa. *Philip. Journ. Sci.* 26 (1925) 345-413.
122. PARADICE, W. E. J., and G. P. WHITLEY. Northern Territory Fishes. *Mem. Queens. Mus.* 9 (1927-1929) 76-106.
123. PELLEGRIN, JACQUES. Poissons des côtes de l'Angola Mission de M. Gruvel. *Bull. Soc. Zool. France* 37 (1912) 290-296.
124. PELLEGRIN, JACQUES. Sur une collection de poissons de Madagascar. *Bull. Soc. Zool. France* 39 (1914) 221-234.
125. PERUGIA, ALBERTO. Elenco dei pesci raccolti dal Dott. Elio Modigliani nelle isole di Nias e di Sumatra. *Ann. Mus. Div. Storia Nat. Genova* II 7 (1889) 269-277.
126. PETERS, WILHELM C. H. Übersicht der in Mossambique beobachteten Seefische. *Monats. Akad. Wiss. Berlin* (1855) 423-466.
127. PETERS, WILHELM C. H. Uebersicht der von Dr. K. Möbius in Mauritius und bei den Seychellen gesammelten Fische. *Monats. Akad. Berlin* [1875 (1876)] 435-449.
128. PETERS, WILHELM C. H. Uebersicht der während der von 1874 bis 1876 unter dem Commando des Hrn. Capitän z. S. Freiherrn von Schleinitz ausgeführten Reise S. M. S. *Gazelle* gesammelten und von der kaiserlichen Admiralität der königlichen Akademie der Wissenschaften übersandten Fische. *Monats. Königl. Akad. Wiss. Berlin* (1876) 831-853.
129. PLAYFAIR, L., and A. GÜNTHER. *Fishes of Zanzibar.* London (1866) 1-153.
130. QUOY, J. R. C., and J. P. GAIMARD. *Voyage autour du monde.* Paris (1824) 192-401.
131. REGAN, C. T. On the genus *Lichia* of Cuvier. *Ann. & Mag. Nat. Hist.* (7) 12 (1903) 348-350.
132. REGAN, C. T. Report on the freshwater fishes collected by the British Ornithologists' Union Expedition and the Wollaston Expedition in Dutch New Guinea. *Trans. Zool. Soc. London* 20 (1914) 275-286.
133. RICHARDSON, JOHN. Contribution to the ichthyology of Australia. *Ann. & Mag. Nat. Hist.* 11 (1843) 22-28.
134. RICHARDSON, JOHN. Ichthyology of the Voyage of H. M. S. "Erebus" and "Terror." London (1844) 1-139.
135. RÜPPELL, EDUARD. Fische des Rothen Meers. *Atlas zu der Reise im Nördlichen Afrika. Zoologie* 2 (1828) 1-141.
136. RÜPPELL, EDUARD. Neue Wirbelthiere zu der Fauna von Abyssinien gehörig (1835-1840) 1-148.
137. SAUVAGE, M. H. Histoire naturelle des poissons. *Hist. Phys. Nat. Pol. Madagascar* 16 (1891) 543 pp.

138. SEALE, ALVIN. Fishes of the south Pacific. Occ. Pap. B. P. Bishop Mus. 4 (1906) 1-89.
139. SEALE, ALVIN. The fishery resources of the Philippine Islands. I. Commercial Fishes. Philip. Journ. Sci. § A 3 (1908) 513-529.
140. SEALE, ALVIN. New Species of Philippine Fishes. Philip. Journ. Sci. § A 4 (1909) 491-543.
141. SEALE, ALVIN. Fishes of Borneo, with descriptions of four new species. Philip. Journ. Sci. § D 5 (1910) 263-288.
142. SEALE, ALVIN, and B. A. BEAN. On a collection of fishes from the Philippine Islands, made by Major Edgar A. Mearns, Surgeon, U. S. Army, with descriptions of seven new species. Proc. U. S. Nat. Mus. 33 (1907) 229-248.
143. SMITH, HUGH M., and ALVIN SEALE. Notes on a collection of fishes from the island of Mindanao, Philippine Archipelago, with descriptions of new genera and species. Proc. Biol. Soc. Washington 19 (1906) 73-82.
144. SNYDER, JOHN OTTERBEIN. A catalogue of shore fishes collected by the steamer "Albatross" about the Hawaiian Islands in 1902. Bull. U. S. Fish Comm. 22 [1902 (1904)] 513-538.
145. STEINDACHNER, FRANZ. Ichthyologische Beiträge. X. Sitzungsber. Kaiserl. Akad. Wiss. Wien 83 (1881) 179-219.
146. TEMMINCK, C. H., and H. SCHLEGEL. Fauna Japonica 3 (1842) 1-323.
147. VALENCIENNES, M. ACHILLE. Description de quelques espèces nouvelles de poissons envoyées de Bourbon par M. Morel. C. R. Acad. Sci. Paris 54 (1862) 1165-1170; 1201-1207.
148. VINCIGUERRA, D. Catalogo del pesci roccolti a Bornec. Ann. Mus. Civ. Storia Nat. Genova 50 (1921-1926) 533-628.
149. WAKIYA, YOJIRO. The carangoid fishes of Japan. Ann. Carnegie Mus. 15 (1923-1924) 139-292.
150. WALFORD, LIONEL A. Marine game fishes of the Pacific coast from Alaska to the equator (1937) 1-205.
151. WEBER, MAX. Fische von Ambon, Java, Thursday Island, dem Burnett Fluss und von der Süd-Küste von Neu Guinea. Semon, Zoologische Forschungsreisen in Australien und dem malayischen Archipel (1895) 257-276.
152. WEBER, MAX. Die Fische der Siboga Expedition. Leiden (1913) 710 pp.
153. WEBER, MAX, and L. F. DE BEAUFORT. The fishes of Indo-Australian Archipelago 6 (1931) 1-448.
154. WHITLEY, GILBERT P. Studies in ichthyology, No. 1. Rec. Aust. Mus. 15 (1926-1927) 289-304.
155. WHITLEY, GILBERT P. The fishes of Michaelmas Bay, North Queensland. Rec. Aust. Mus. 16 (1927-1929) 1-32.
156. WHITLEY, GILBERT P. Studies in ichthyology. No. 3. Rec. Aust. Mus. 17 (1929-1930) 101-143.
157. WHITLEY, GILBERT P. New names for Australian fishes. Aust. Zoologist 6 (1929-1931) 310-334.
158. WHITLEY, GILBERT P. Studies in ichthyology. No. 4. Rec. Aust. Mus. 18 (1930-1933) 96-133.
159. WHITLEY, GILBERT P. Studies in ichthyology. No. 6. Rec. Aust. Mus. 18 (1930-1933) 321-348.

ILLUSTRATIONS

PLATE 1

- FIG. 1. *Megalaspis cordyla* (Linnæus).
2. *Decapterus macrosoma* Bleeker.
3. *Caranx* (*Selar*) *mate* Cuvier and Valenciennes.

PLATE 2

- FIG. 1. *Caranx* (*Selar*) *boops* Cuvier and Valenciennes.
2. *Caranx* (*Selar*) *crumenophthalmus* (Bloch).
3. *Caranx* (*Selar*) *malam* Bleeker.

PLATE 3

- FIG. 1. *Caranx* (*Selar*) *djedaba* (Forskål).
2. *Caranx* (*Selar*) *kalla* Cuvier and Valenciennes.
3. *Caranx* (*Carangoides*) *compressus* Day.

PLATE 4

- FIG. 1. *Caranx* (*Carangoides*) *auroguttatus* Cuvier and Valenciennes.
2. *Caranx* (*Carangoides*) *præustus* Bennett.
3. *Caranx* (*Carangoides*) *fulvoguttatus* (Forskål).

PLATE 5

- FIG. 1. *Caranx* (*Carangoides*) *gymnostethoides* Bleeker.
2. *Caranx* (*Carangoides*) *armatus* (Forskål).
3. *Caranx* (*Carangoides*) *oblongus* Cuvier and Valenciennes.

PLATE 6

- FIG. 1. *Caranx* (*Carangoides*) *chrysophrys* Cuvier and Valenciennes.
2. *Caranx* (*Carangoides*) *malabaricus* (Bloch and Schneider).
3. *Caranx* (*Carangoides*) *dinema* Bleeker.

PLATE 7.

- FIG. 1. *Caranx* (*Caranx*) *sexfasciatus* (Quoy and Gaimard).
2. *Caranx* (*Caranx*) *stellatus* Eydoux and Souleyet.
3. *Caranx* (*Caranx*) *ignobilis* (Forskål).

PLATE 8.

- FIG. 1. *Caranx* (*Caranx*) *carangus* Bloch.
2. *Caranx* (*Selaroides*) *leptolepis* Cuvier and Valenciennes.
3. *Caranx* (*Gnathanodon*) *speciosus* Forskål.

PLATE 9

- FIG. 1. *Ulua mandibularis* (Macleay).
2. *Alectis ciliaris* (Bloch).
3. *Alectis indica* (Rüppell).

PLATE 10

- FIG. 1. *Scomberoides lysan* (Forskål).
2. *Scomberoides toloo-parak* (Rüppell).
3. *Scomberoides tala* (Cuvier and Valenciennes) Day.

PLATE 11

- FIG. 1. *Scomberoides tol* Cuvier and Valenciennes.
2. *Trachinotus blochi* (Lacépède).
3. *Trachinotus bailloni* Lacépède.

PLATE 12

- FIG. 1. *Elagatis bipinnulatus* (Quoy and Gaimard).
2. *Seriola nigrofasciata* (Rüppell).



PLATE 1.

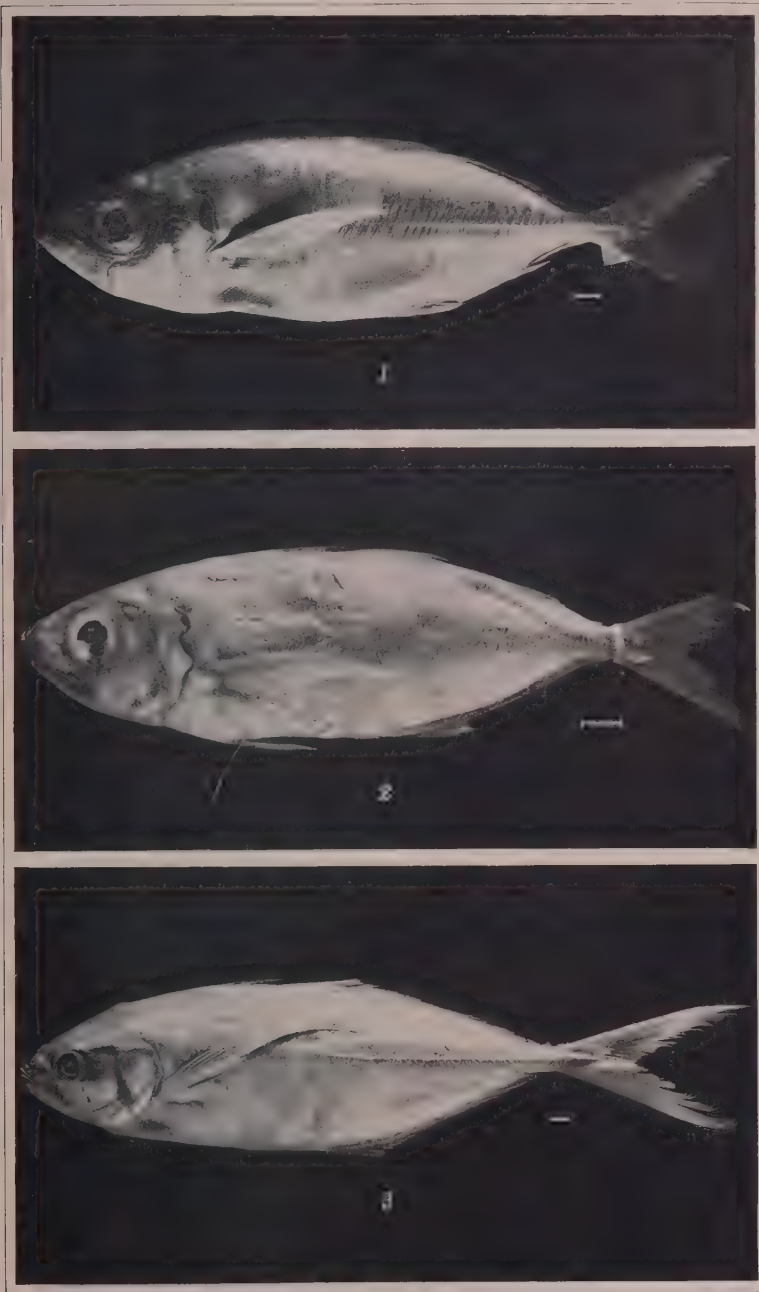


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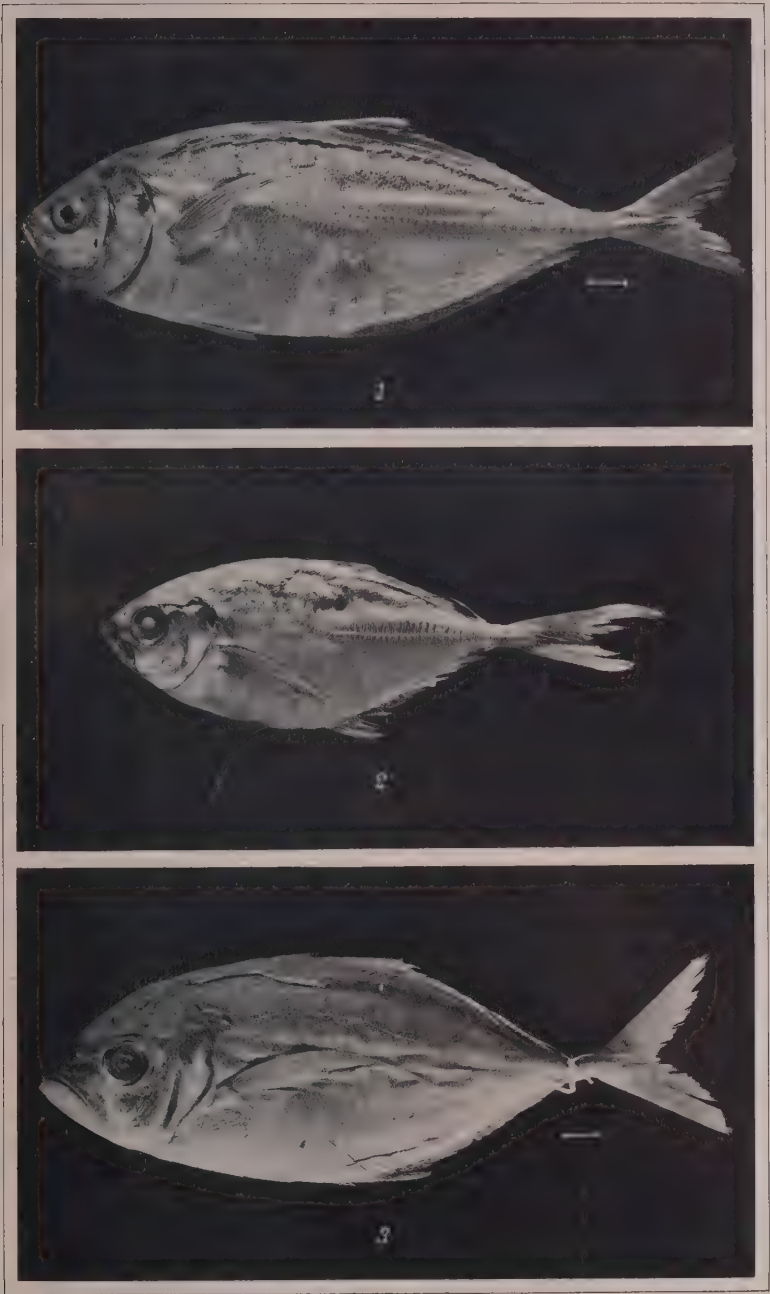


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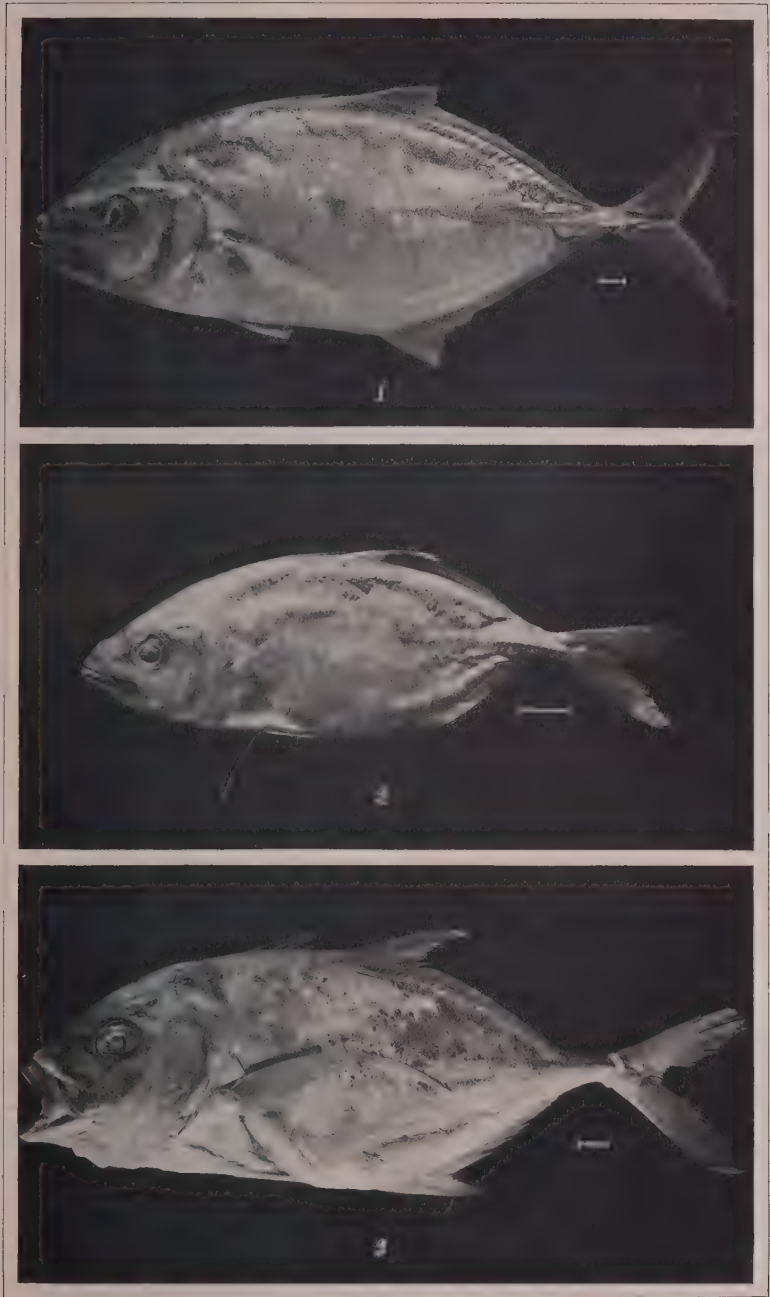


PLATE 4.



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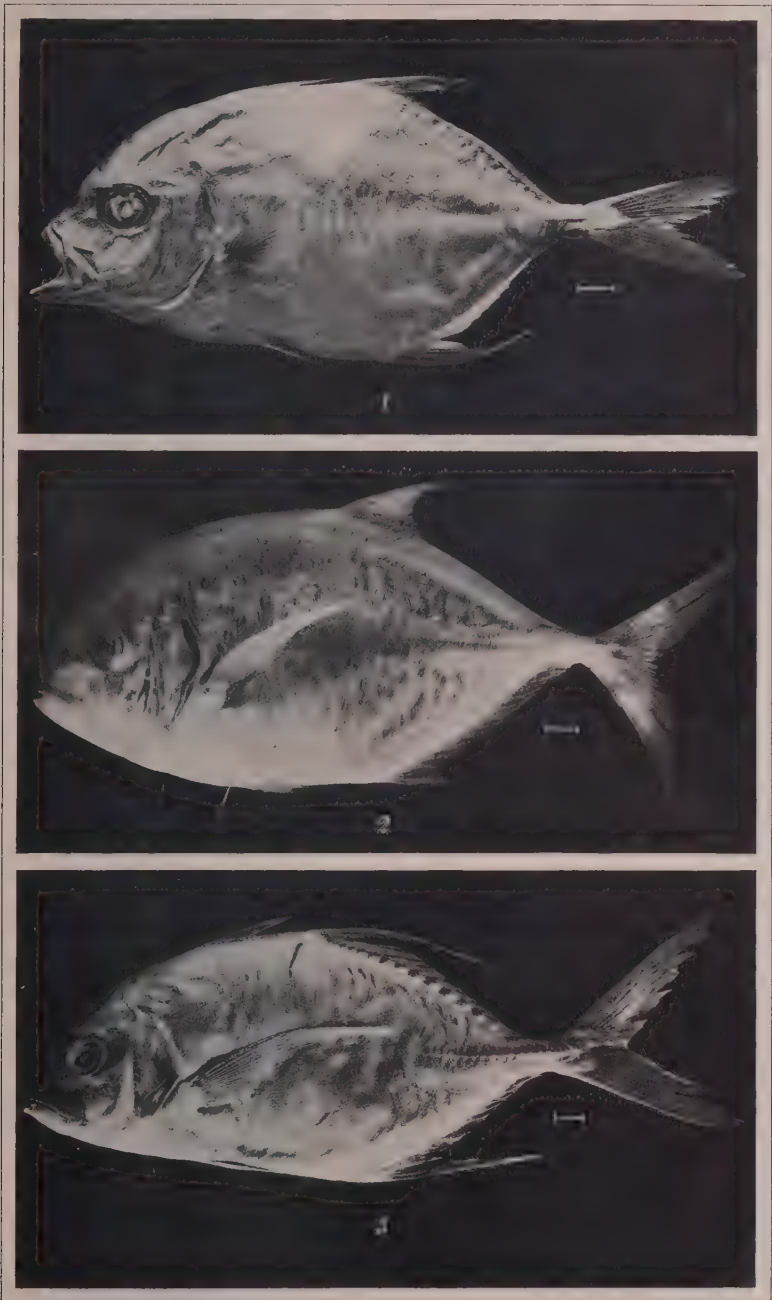
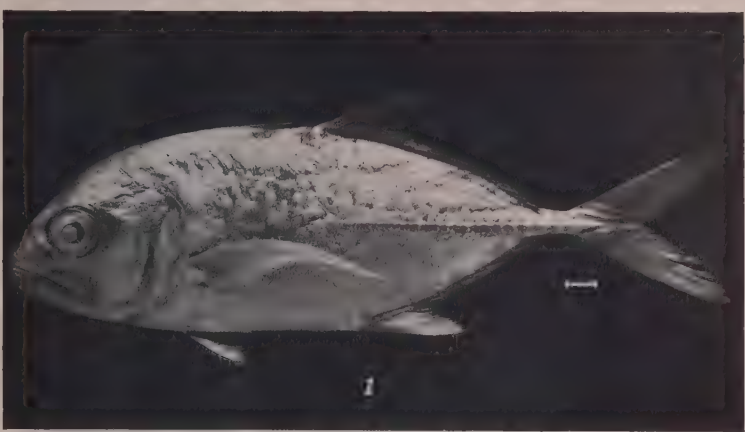


PLATE 6.



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PLATE 7.



PLATE 8.

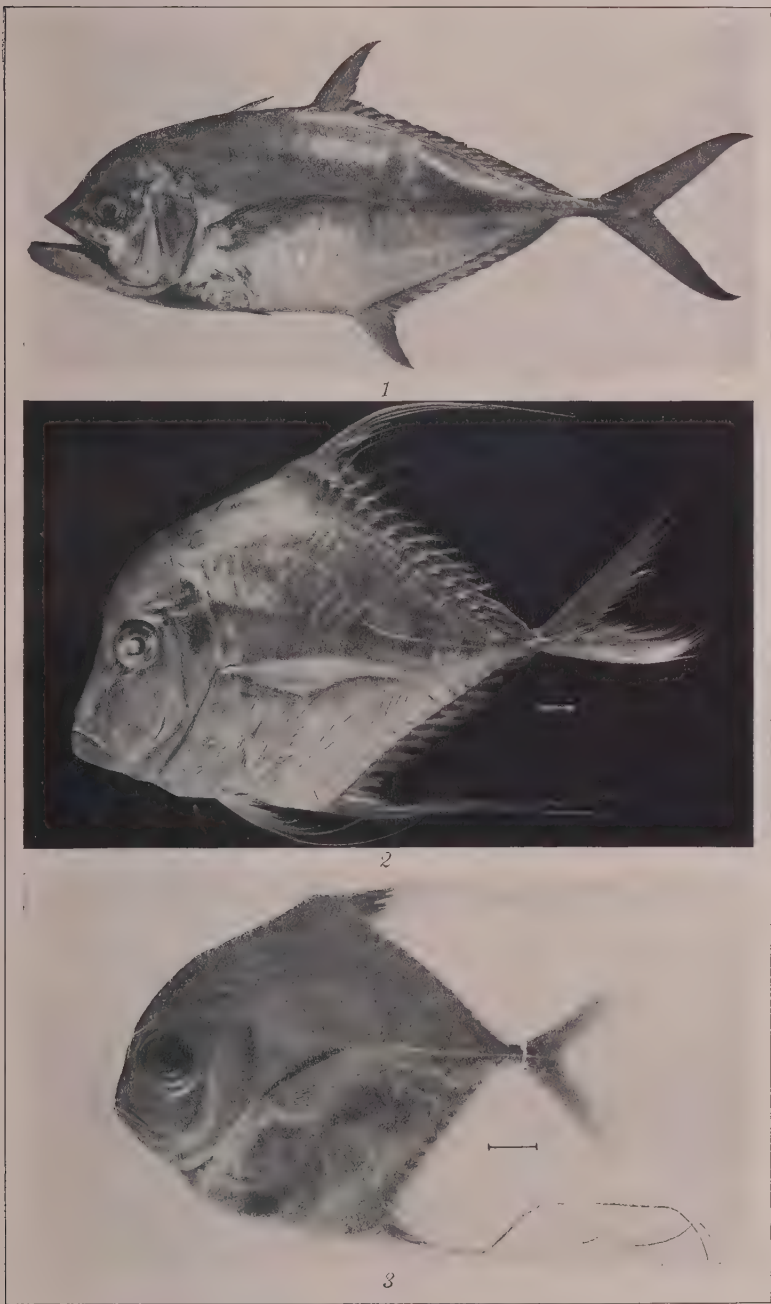


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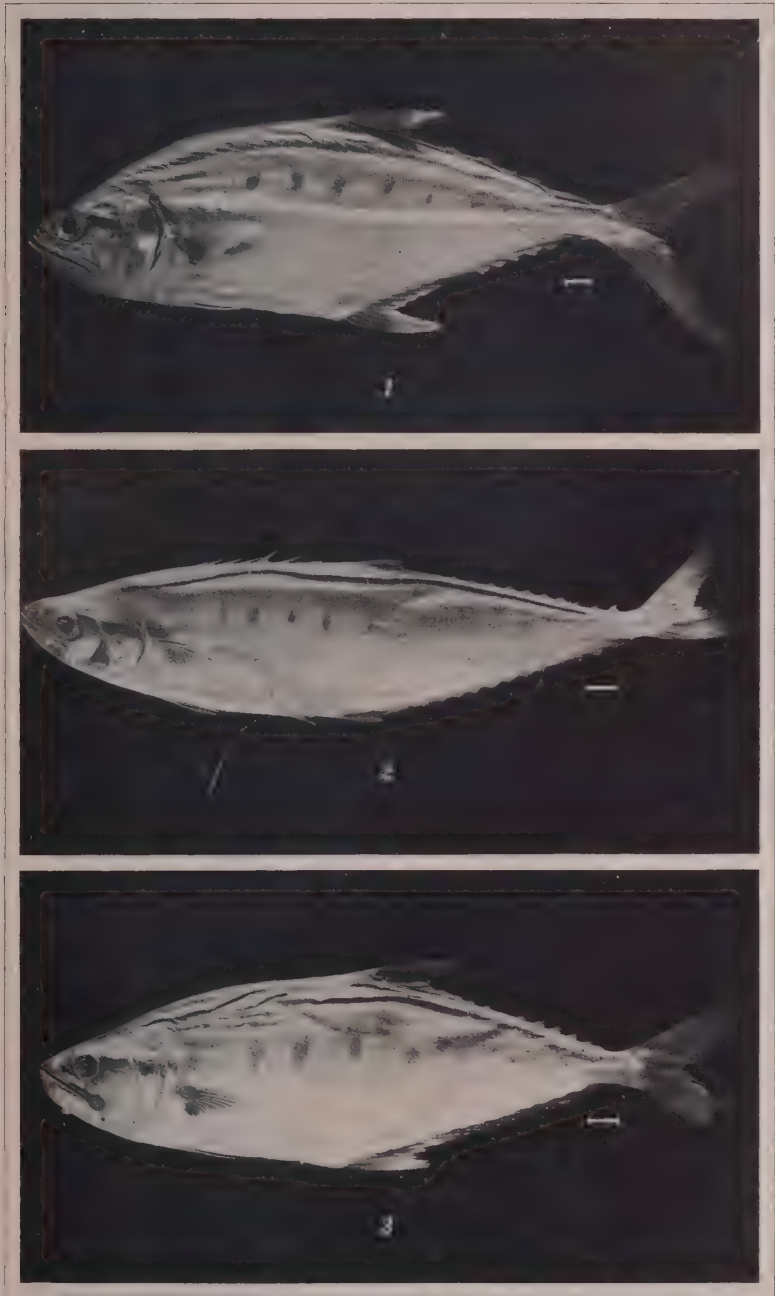


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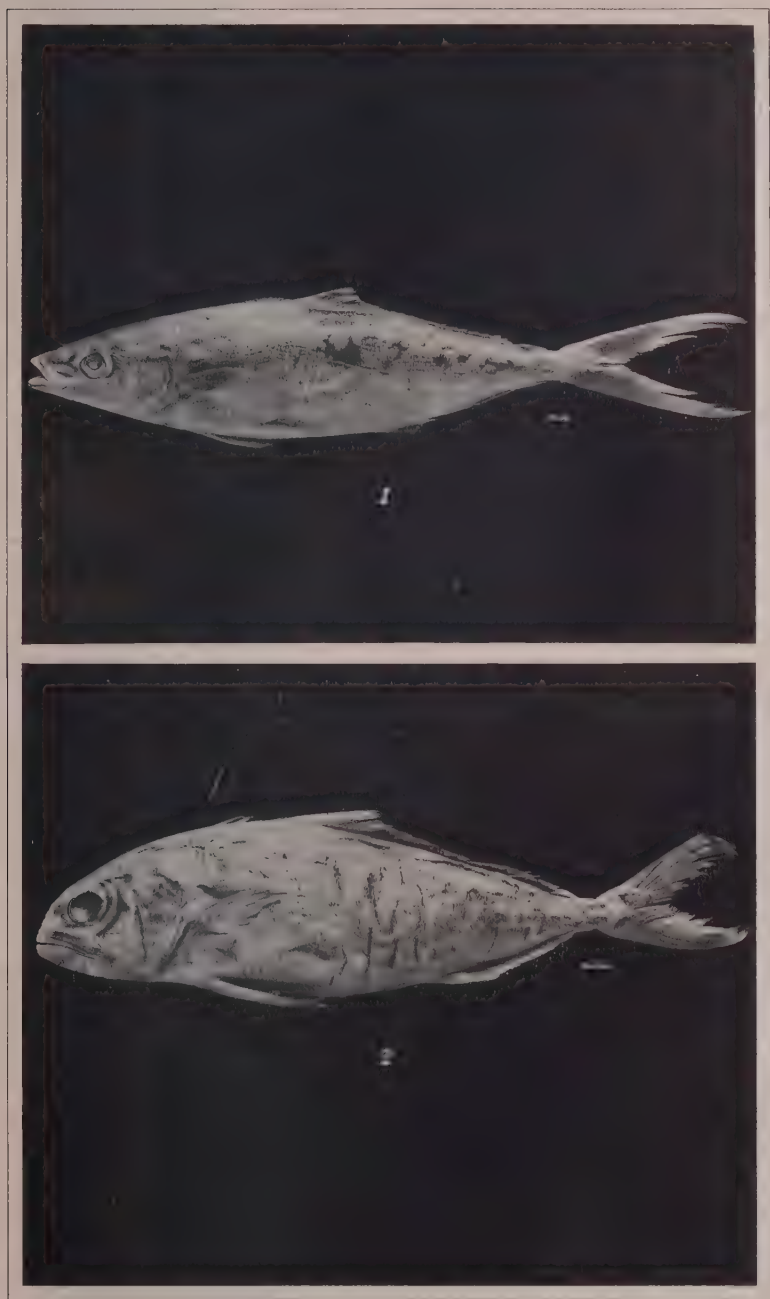


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